AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

In the claims

Claims 1-50 (canceled).

Claim 51 (new): A method of treating or preventing a disorder selected from the group consisting of disorders in which treatment with a β-antagonist is indicated, disorders associated with oxidative stress and free radical injury, and disorders in which treatment with a smooth muscle relaxant is indicated, in a mammal in need thereof, comprising administering to said mammal an effective amount of a multifunctional β-blocker compound comprising

i) a β-blocker component,

ii) at least one reactive oxygen species (ROS) scavenger component, and optionally

iii) at least one nitric oxide (NO) donor component.

Claim 52 (new): A method according to claim 51, wherein said multifunctional β-blocker compound comprises

i) a β-blocker component,

ii) at least one reactive oxygen species (ROS) scavenger component, and

iii) at least one nitric oxide (NO) donor component.

Claim 53 (new): A method according to claim 51, wherein said β-blocker component is selected from the group consisting of compounds used in medicine as β-adrenergic blockers, derivatives thereof, and compounds exhibiting affinity for β-receptors.

Claim 54 (new): A method according to claim 51, wherein said ROS-scavenger component comprises an antioxidant reacting with ROS selected from the group consisting of superoxide, hydroxyl radicals, peroxynitrite, and hypochlorite.

Claim 55 (new): A method according to claim 51, wherein said NO-donor comprises a group capable of providing nitric oxide in a form selected from uncharged and charged.

Claim 56 (new): A method according to claim 51, wherein said ROS-scavenger component comprises a substituted N-oxide free radical, or a substituted or unsubstituted lipoic acid moiety.

Claim 57 (new): A method according to claim 51, wherein said ROS-scavenger component comprises any of alkenyl group, aryl group, substituted aryl group, sulfhydryl, dithiol in oxidized or reduced form, and group that is converted *in vivo* into a sulfhydryl in its oxidized or reduced form.

Claim 58 (new): A method according to claim 56, wherein the N-atom of said N-oxide is a member of 3 to 7 membered heterocyclic ring.

Claim 59 (new): A method according to claim 51, wherein said NO donor component comprises a group selected from —ONO_2, —ONO, —SNO, and —NONOate.

Claim 60 (new): A method according to claim 51, wherein said disorder is selected from the group consisting of cardiovascular, pulmonary, neurological, hormonal, and ocular.

Claim 61 (new): A method according to claim 51, wherein said disorder is selected from the group consisting of ischemia, ischemia-reperfusion tissue injury, acute and chronic inflammatory conditions, angina, atherosclerosis, impotence, hypertension, pulmonary hypertension, systemic hypertension, obesity or pregnancy-induced hypertension, palpitations,

arrhythmias, cardiomyopathy, congestive heart failure, hyperthyroidism, anxiety, tremor, migraine, alcohol withdrawal, tachycardia, thyrotoxicosis, pheochromocytoma, esophageal varices, glaucoma, conditions associated with excess intraocular fluid, diabetes mellitus, and carcinogenesis.

Claim 62 (new): A method according to claim 51, further comprising treating or preventing an adverse effect caused by β-antagonists.

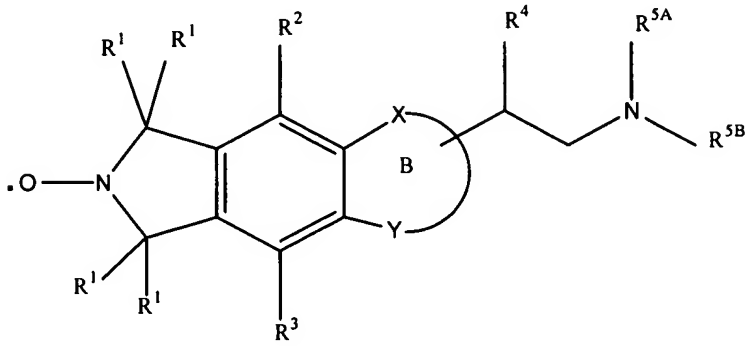
Claim 63 (new): A method according to claim 62, wherein said adverse effect is selected from the group consisting of induced congestive hear failure, induced or exacerbated heart failure, acute myocardial infarction or cardiomegaly, blockage of β_2-receptors in bronchial smooth muscle, increasing airway resistance, fatigue, sleep disturbances, memory loss and depression, and complications associated with diabetes.

Claim 64 (new): A method according to claim 51, wherein said β-blocker component is derived from a β-antagonist used in medicine selected from the group consisting of Acebutolol, Alprenolol (Aptin), Amosulalol, Arotinolol, Atenolol (Atehexal), Befunolol, Betaxolol, Bevantolol, Bisprolol (Zebeta), Bopindolol, Bucumolol, Bufetolol, Bufuralol, Bunitrolol, Bupranolol, Butidrine Hydrochloride, Butofilolol, Carazolol, Carteolol, Carvedilol (Coreg, Dilatrend, Kredex), Carvedilol, Celiprolol, Cetamolol, Cloranolol, Dilevalol, Disopryamide (Norpace), Epanolol, Esmolol, Indenolol, Labetalol, Levobunolol, Mepindolol, Metipranolol, Metohexal (Meijoprolol), Metoprolol (Betaloc), Metoprolol, Moprolol, Nadolol, Nadoxolol, Nebivolol, Nifenalol, Nipradilol, Oxprenolol (Corbeton), Penbutolol, Pindolol, Practolol, Pronethalol, Propranolol, Quinidine Gluconate (Quinaglute), Quinidine Polygalacturonate (Cardioquin), Quinidine Sulfate (Quinidex, Cin-quin), Sotalol (Sotocor, Sotahexal), Sulfinalol, Talinolol, Tertatolol, Tilisolol, Timolol, Toliprolol, Toprol XL, and Xibenolol.

Claim 65 (new): A method according to claim 51, wherein said β-blocker component is derived from a β-antagonist selected from the group consisting of Carteolol, Oxprenolol, Nadolol,

Propranolol, Metoprolol, Metipranol, Pindolol, Betaxolol, Atenolol, Esmololol, Levobunolol, Labetalol, and Tomolol.

Claim 66 (new): A method according to claim 51, wherein said compound has Formula I



wherein R^1 may be independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted aryl, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

R^2 and R^3 may be independently hydrogen or $(CH_2)_nX^1$, n being from 0 to 4, and X^1 being H, OH, =O (where n is not 0) or a group capable of donating NO, or

R^2 and R^3 may be independently selected from H, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted aryl, and substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO;

R^4 may be $(CH_2)_mX^2$, m being from 0 to 4, and X^2 being H, SH, OH, =O (where m is not 0) or a group capable of donating NO, or R^4 may be H, SH, OH, substituted or

unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO;

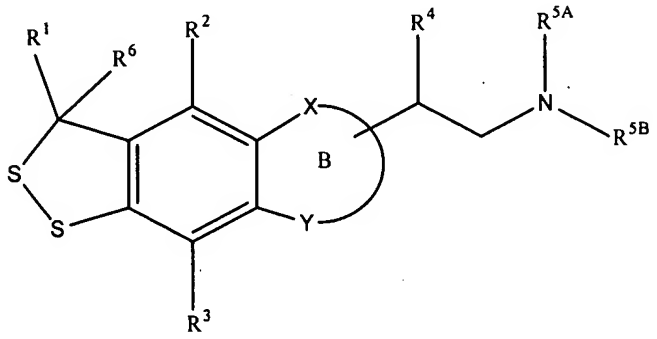
R^{5A} and R^{5B} may be, independently, $(CH_2)_p X^3$, p being from 0 to 4, and X^3 being H, OH, =O (where p is not 0) or a group capable of donating NO, or R^{5A} and R^{5B} may be, independently, H, OH, =O, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycle, wherein the optional substituent may bea group capable of donating NO;

and wherein

X and Y may independently be –CH=CH-, $(CH_2)_q$ while q is from 0 to 3, O, S, NH, CH_2, or NR^7, wherein R^7 may be hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted

or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO; and where ring B is a 5-, 6- or 7-membered ring.

Claim 67 (new): A method according to claim 51, wherein said compound has Formula II



wherein R^1 and R^6 may be independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted aryl, or substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO;

R^2 and R^3 may be independently hydrogen, or $(CH_2)_nX^1$ while n being from 0 to 4, and X^1 being H, OH, =O (where n is not 0) or a group capable of donating NO, or R^2 and R^3 may be independently H, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy,substituted or unsubstituted aryl, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

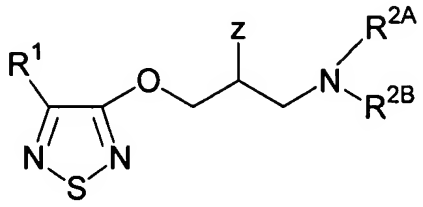
R^4 may be $(CH_2)_mX^2$ while m being from 0 to 4, and X^2 being H, SH, OH, =O (where m is not 0) or a group capable of donating NO, or R^4 may be H, SH, OH, substituted or

unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

R^{5A} and R^{5B} may be, independently, $(CH_2)_p X^3$ while p being from 0 to 4, and X^3 being H, OH, =O (where p is not 0) or a group capable of donating NO, or R^{5A} and R^{5B} may be, independently, H, OH, =O, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO; and

X and Y may independently be –CH=CH-, $(CH_2)_q$ while q being from 0 to 3, O, S, NH, CH_2, or NR^7, wherein R^7 may be hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted or unsubstituted heterocycles; wherein the optional substituent may be a group capable of donating NO; and wherein ring B is a 5-, 6- or 7-membered ring.

Claim 68 (new): A method according to claim 51, wherein said compound has Formula IA

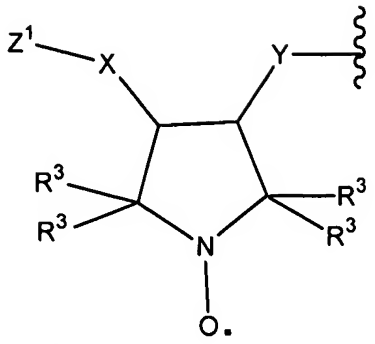


wherein R^1 is a group comprising a substituted N-oxide free radical, wherein the N-oxide free radical is contained within a 5- or 6-membered ring, and optionally further comprises a group capable of donating NO, or R^1 is a group selected from IIA, IIIA, IVA, and VA as shown below, where the groups of Formulae IIA-VA are linked to Formula IA at position R^1, through substituent Y of Formulae IIA-VA;

Z is halo, nitrato, nitroso, nitrile, hydroxyl, thiol, sulfonamido, amino, guanadino, isoguanadino, cyano, isocyano, and carboxyl; and

R^{2A} and R^{2B} are independently hydrogen, =O, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, phenyl, substituted phenyl or heterocyclyl, wherein the optional substitution comprises one or more groups capable of donating NO group, or one or more groups being ROS scavengers; and wherein

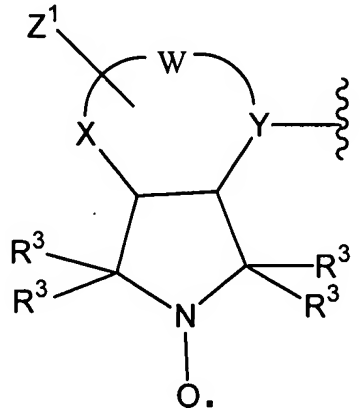
IIA has structure



in which R^3 is independently hydrogen or C_1-C_4 alkyl;

Y is selected from $(CH_2)_n$ while n being from 0 to 3, O, NH, S, substituted or unsubstituted acyl, acyloxy, alkynyl, alkene, alkyl, alkoxy, aryloxy, arylamine, arylsulphide, arylsulphone, or arylsulfurdioxide; X is selected from $(CH_m)_p$ while m being 2 or 3 and p from 0 to 3, O, -N=N-, S, NH, CH_3N-, substituted or unsubstituted acyl, acyloxy, alkynyl, alkene, alkyl, alkoxy, aryloxy, arylamine, arylsulphide, arylsulphone, arylsulfurdioxide; and Z^1 is H OH, ONO, ONO_2, SNO;

IIIA has structure

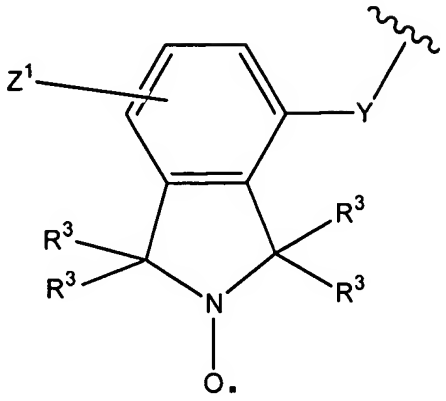


in which R^3 is independently hydrogen or C_1-C_4 alkyl;

W is is $(CH_m)_n$ while m being from 0 to 2 and n being from 0 to 3, where W may be substituted or unsubstituted.; X is selected from (CH_p) while p 1 or 2, O, -N=N-, S, and NH, or X is absent; Y is (CH) or N; and Z^1 is selected from H, OH, CH_2ONO, CH_2CH_2ONO, CH_2ONO_2, $CH_2CH_2ONO_2$, ONO, ONO_2, SNO, and

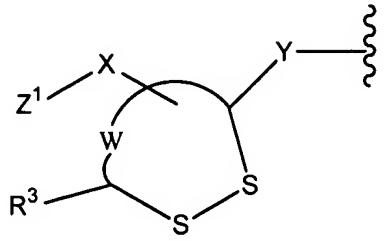
NONOate; wherein IIIA may include 1-3 Z^1 substituents on the ring to which Z^1 is attached;

IVA has structure



in which R^3 may be independently hydrogen or C_1-C_4 alkyl; Y may be CH_2, O, NH, S, substituted or unsubstituted alkylene, or it can be absent; Z^1 may be CH_2ONO, CH_2CH_2ONO, CH_2ONO_2, $CH_2CH_2ONO_2$, NO, NO_2, ONO, ONO_2, SNO, or OH, wherein IVA may include 1-3 of the Z^1 substituents on the ring to which Z^1 is attached;

VA has structure



in which R^3 is hydrogen or C_1-C_4 alkyl; W is $(CH_m)_n$ while m being from 0 to 2 and n being from 0 to 3, where W can be substituted or unsubstituted; X is selected from (CH_p) while p being 1 or 2, O, -N=N-, S, NH, CH_3N-,and substituted or unsubstituted alkylene, or X is absent; Y is selected from CH_2, O, NH, S or substituted or unsubstituted alkylene, or Y is absent; and Z^1 is OH, ONO, ONO_2, $N(NO)_2$, or SNO.

Claim 69 (new): A method according to claim 66, wherein R^{5A} and R^{5B} are selected as shown in Tables I', II', III', and IV'

i. Table I'

R^{5A}/R^{5B}
CH_3-
C_5H_9-
$C_6H_5SO_2O$-
CH_3CO-
$C_6H_5SO_2NH$-
$(C_6H_5SO_2)_2N$-
C_4H_8
C_5H_{10}
C_5H_{11}

Table II'

R^{5A}	R^{5B}
CH_3-	$-C(CH_3)_3$
$(CH_3)_2CH$-	$-C(CH_3)_3$
$CH_3CH_2CH_2$-	$-C(CH_3)_3$
CH_3-	$-CH(CH_3)_2$
CH_3-	$-C(CH_3)_2CH_2OH$
$CH_3CH_2CH_2CH_2$-	$-C(CH_3)_3$
CH_3-	4-CF_3-Ph-
CH_3CH_2-	$-C(CH_3)_3$
CH_3-	$-CH_3$
CH_3-	3,4,5-tri(CH_3O-)Ph-

Table III'

R^{5A}	R^{5B}
CH_3CH_2-	-$C(CH_3)_3$
$CH_3CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2$-	-$C(CH_3)_3$

Table IV'

R^{5A}	R^{5B}
CH_3-	-$C(CH_3)_3$
CH_3-O-CH_2CH_2-	-$C(CH_3)_3$
CH_3-	-$CH_2CH_2CH(SCH_3)CH_3$

Claim 70 (new): A method according to claim 67, wherein R^{5A} and R^{5B} are selected as shown in Tables I', II', III', and IV'

ii. Table I

R^{5A}/R^{5B}
CH_3-
C_5H_9-
$C_6H_5SO_2O$-
CH_3CO-
$C_6H_5SO_2NH$-
$(C_6H_5SO_2)_2N$-
C_4H_8
C_5H_{10}
C_5H_{11}

Table II

R^{5A}	R^{5B}
CH_3-	-$C(CH_3)_3$
$(CH_3)_2CH$-	-$C(CH_3)_3$
$CH_3CH_2CH_2$-	-$C(CH_3)_3$
CH_3-	-$CH(CH_3)_2$
CH_3-	-$C(CH_3)_2CH_2OH$
$CH_3CH_2CH_2CH_2$-	-$C(CH_3)_3$
CH_3-	4-CF_3-Ph-
CH_3CH_2-	-$C(CH_3)_3$
CH_3-	-CH_3
CH_3-	3,4,5-tri(CH_3O-)Ph-

Table III

R^{5A}	R^{5B}
CH_3CH_2-	-$C(CH_3)_3$
$CH_3CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2$-	-$C(CH_3)_3$

Table IV

R^{5A}	R^{5B}
CH_3-	-$C(CH_3)_3$
CH_3-O-CH_2CH_2-	-$C(CH_3)_3$
CH_3-	-$CH_2CH_2CH(SCH_3)CH_3$

Claim 71 (new): A method according to claim 68, wherein R^{2A} and R^{2B} are selected as shown in Tables I, II, III, and IV

iii. Table I

R^{2A}/R^{2B}
CH_3-
C_5H_9-
$C_6H_5SO_2O$-
CH_3CO-
$C_6H_5SO_2NH$-
$(C_6H_5SO_2)_2N$-
C_4H_8
C_5H_{10}
C_5H_{11}

Table II

R^{2A}	R^{2B}
CH_3-	$-C(CH_3)_3$
$(CH_3)_2CH$-	$-C(CH_3)_3$
$CH_3CH_2CH_2$-	$-C(CH_3)_3$
CH_3-	$-CH(CH_3)_2$
CH_3-	$-C(CH_3)_2CH_2OH$
$CH_3CH_2CH_2CH_2$-	$-C(CH_3)_3$
CH_3-	4-CF_3-Ph-
CH_3CH_2-	$-C(CH_3)_3$
CH_3-	$-CH_3$
CH_3-	3,4,5-tri(CH_3O-)Ph-

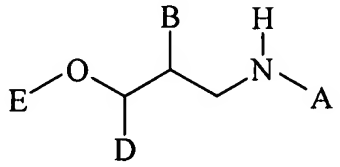
Table III

R^{2A}	R^{2B}
CH_3CH_2-	-$C(CH_3)_3$
$CH_3CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2CH_2$-	-$C(CH_3)_3$
$CH_3CH_2OC(O)CH_2$-	-$C(CH_3)_3$

Table IV

R^{2A}	R^{2B}
CH_3-	-$C(CH_3)_3$
CH_3-O-CH_2CH_2-	-$C(CH_3)_3$
CH_3-	-$CH_2CH_2CH(SCH_3)CH_3$

Claim 72 (new): A method according to claim 51, wherein said multifunctional β-blocker compound has formula III



wherein A is C_1-C_4 alkyl or ROS-scavenger group;

B is selected from OH, O-NO_2 and SH;

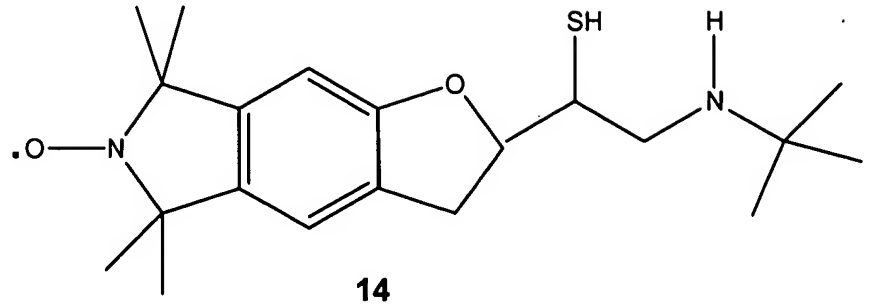
D is H, or D is $(CH_2)_2$ and is connected to E and together with the neighboring atoms forms a 5-6 membered ring consisting of carbon atoms and one oxygen atom; and

E is phenyl condensed with optionally substituted phenyl or optionally substituted 5-6 membered heterocycle containing one of -N- , -O-, and –S-S-; or

E is thiadiazolyl substituted with morpholinyl or pyrrolidinyl-N-oxide, said morpholinyl being optionally substituted with one of OH, NO-donor group, and ROS-scavenger

group, and said pyrrolidinyl-N-oxide group being bound to said thiadiazolyl vial -S- or via -CH_2-O-.

Claim 73 (new): A method according to claim 51, wherein said multifunctional β-blocker compound is selected from the group consisting of compounds nos. 14, 15, 20-75, 1', 2', and 7'-24' as shown below:



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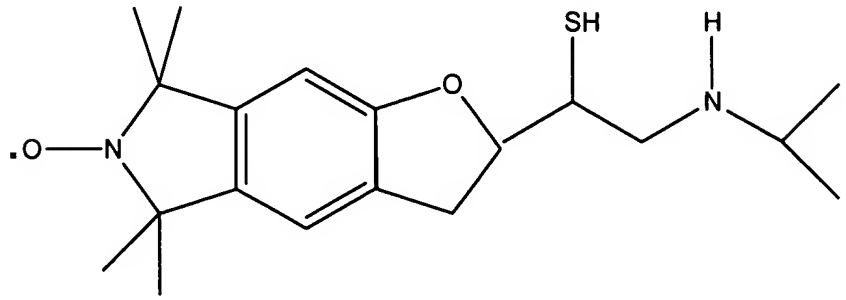

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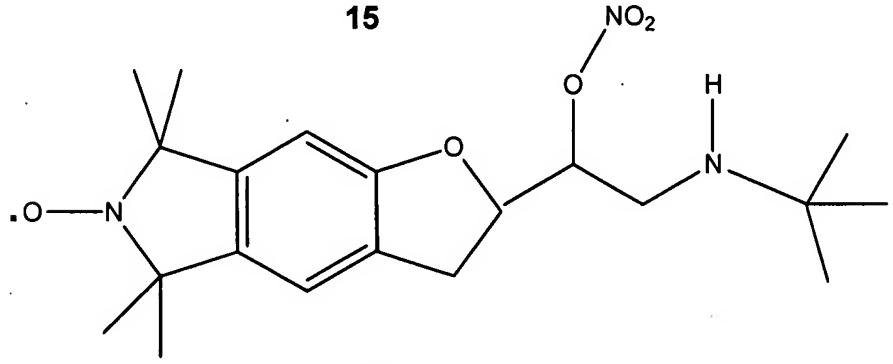

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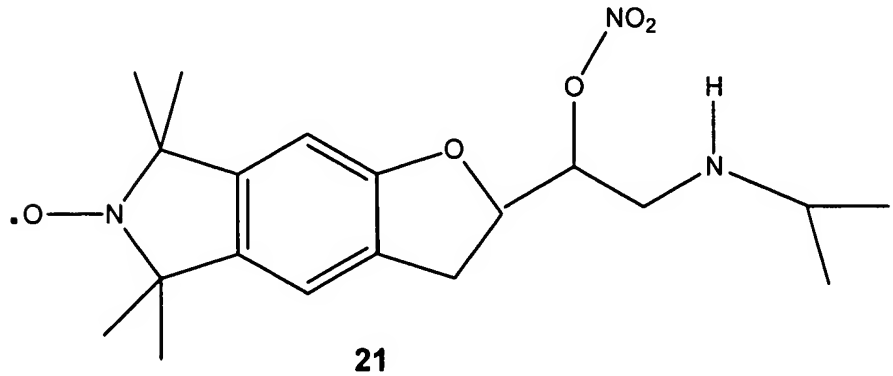

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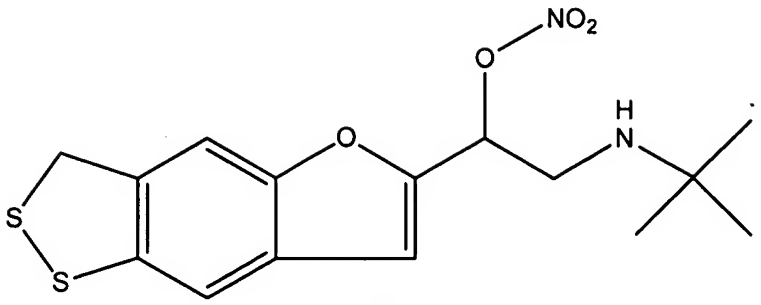

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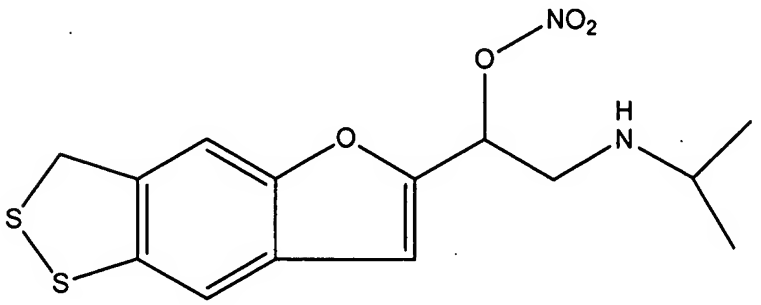

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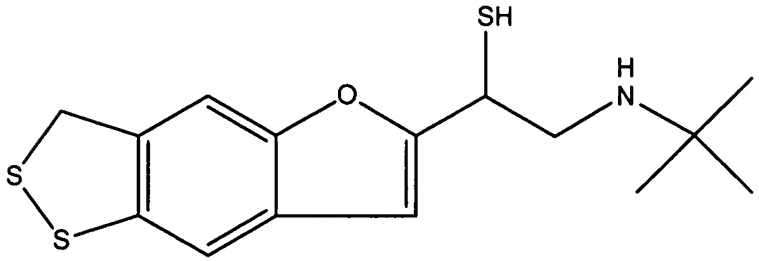

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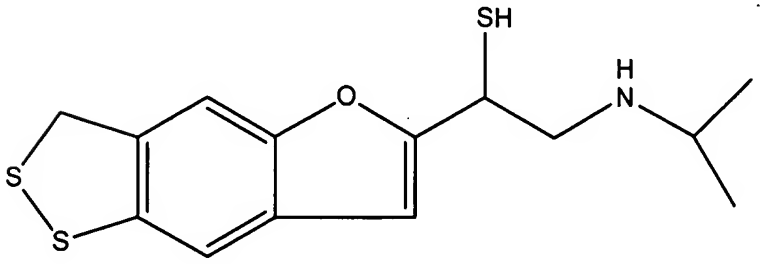

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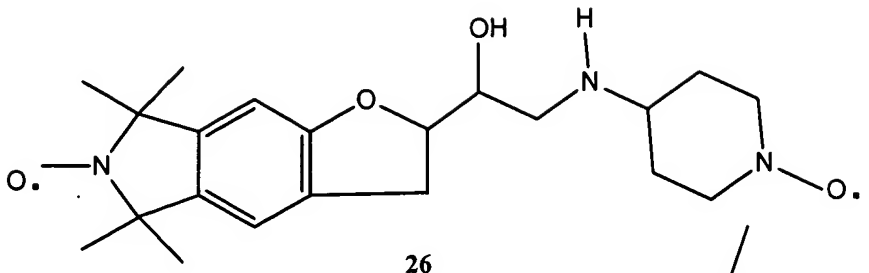

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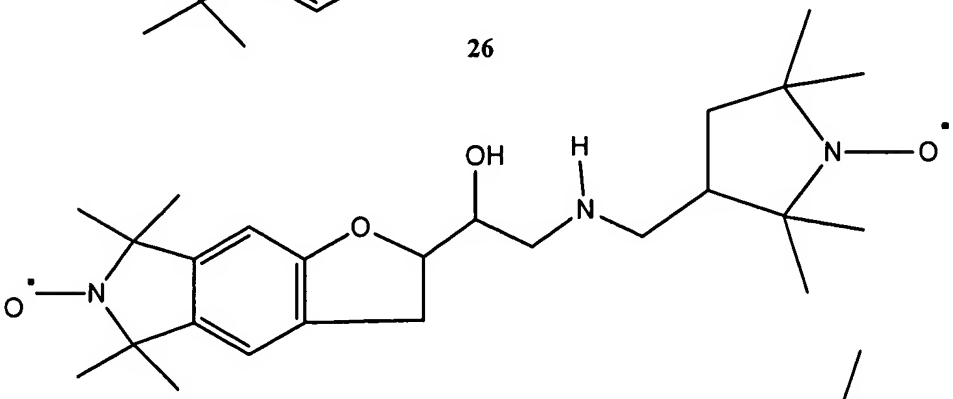

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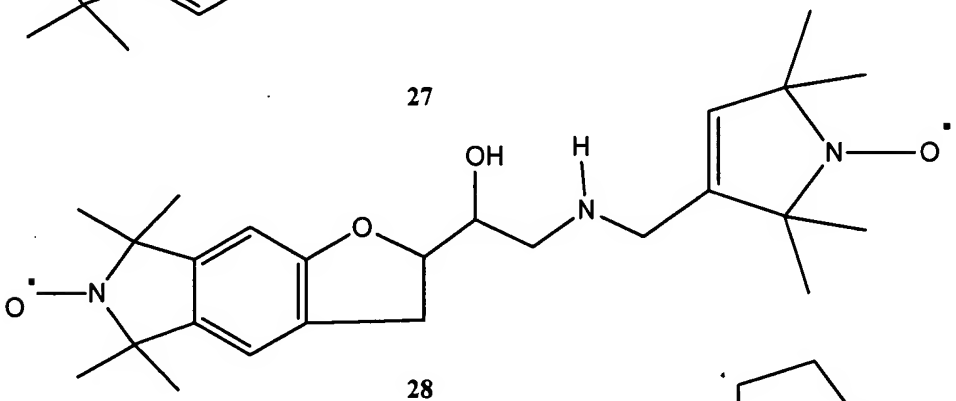

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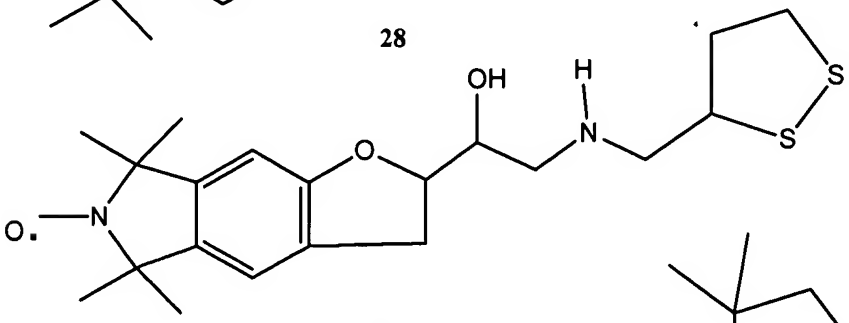

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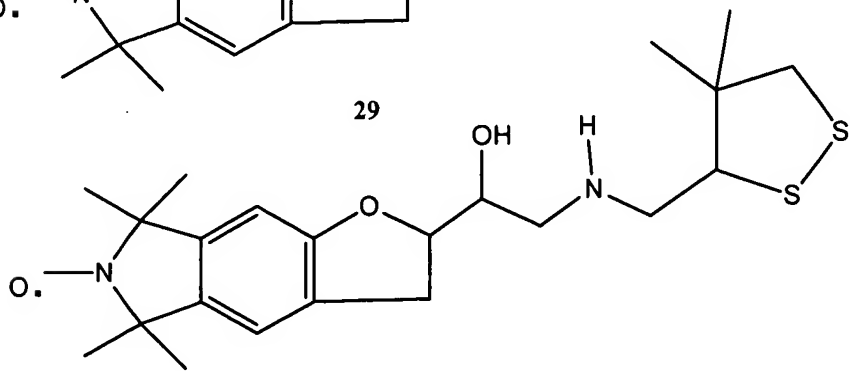

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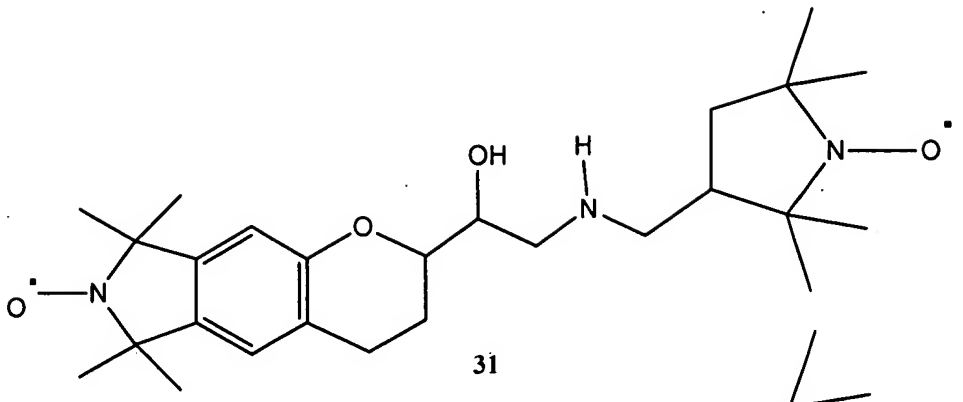

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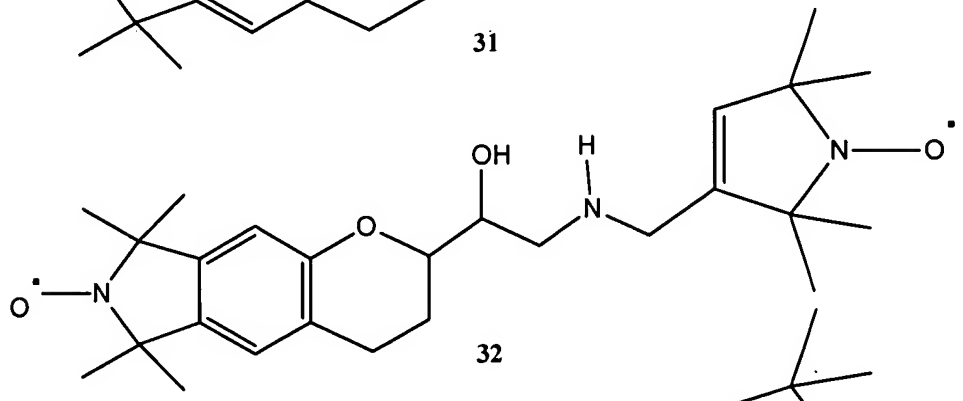

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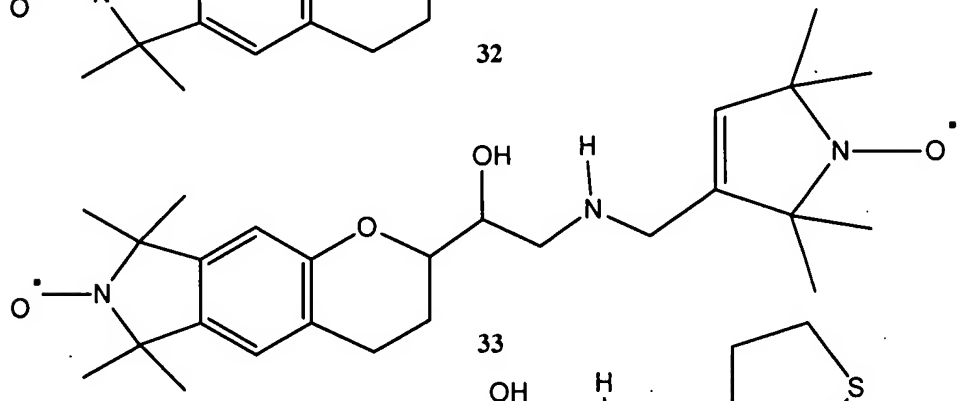

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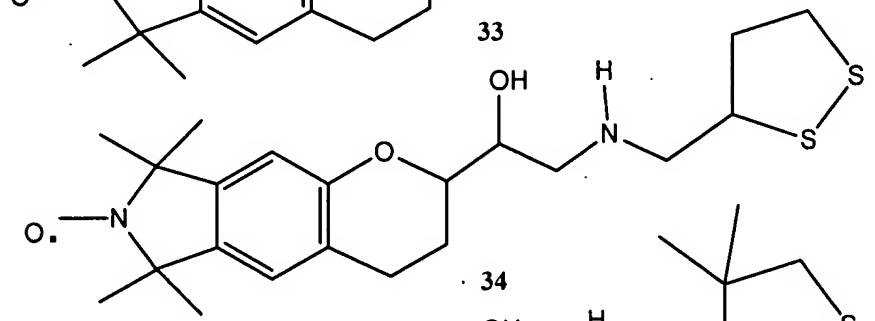

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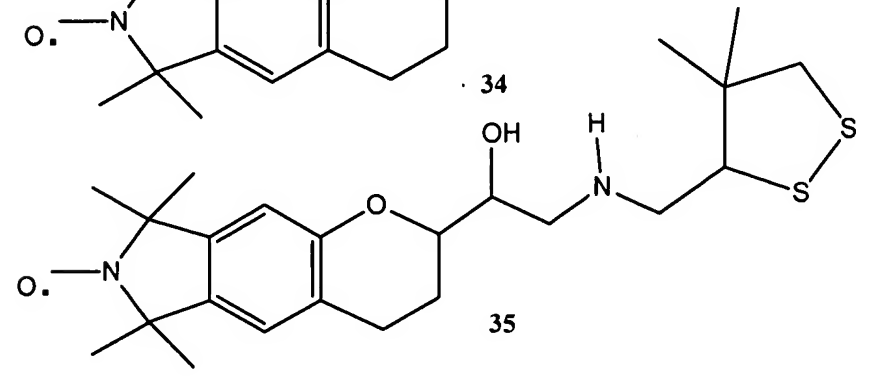

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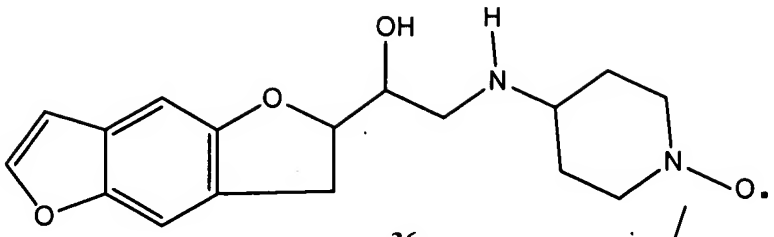

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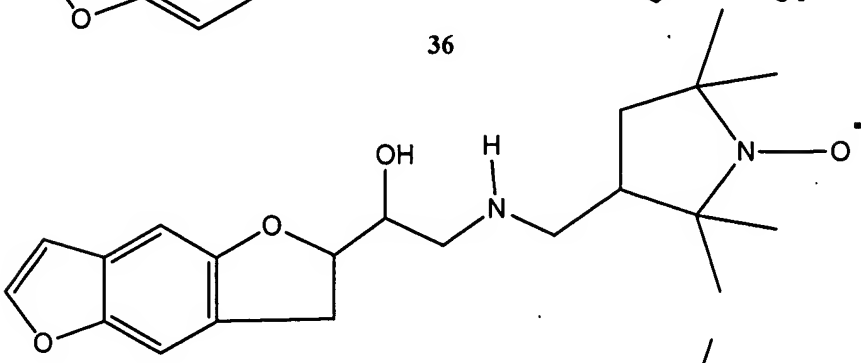

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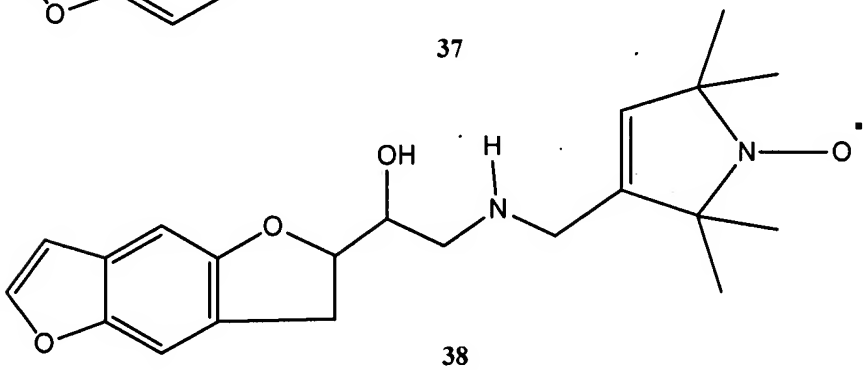

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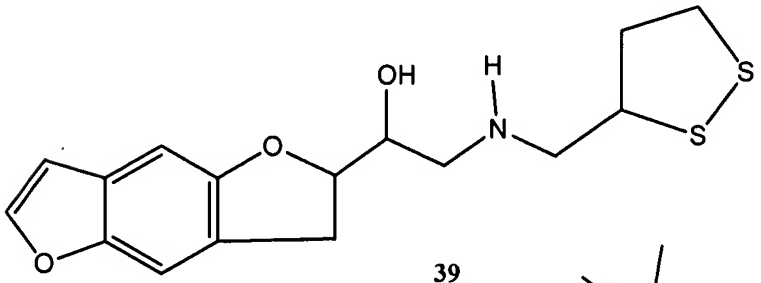

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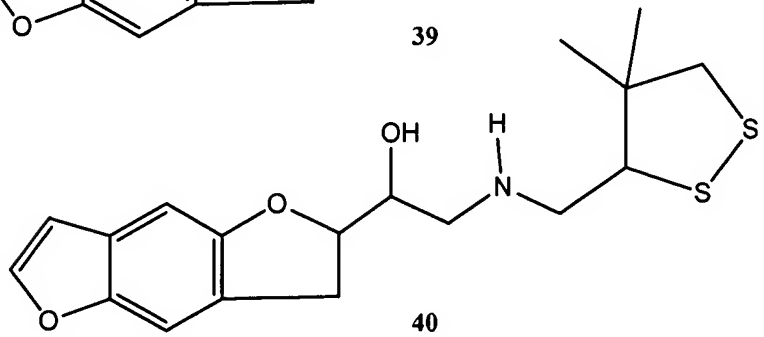

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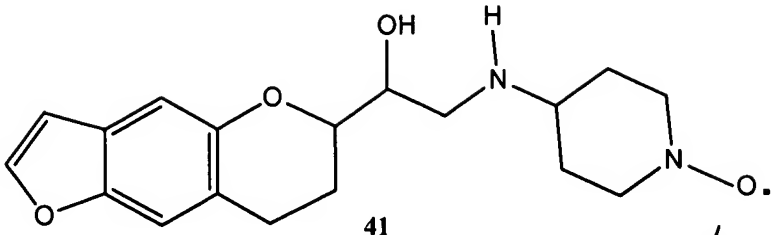

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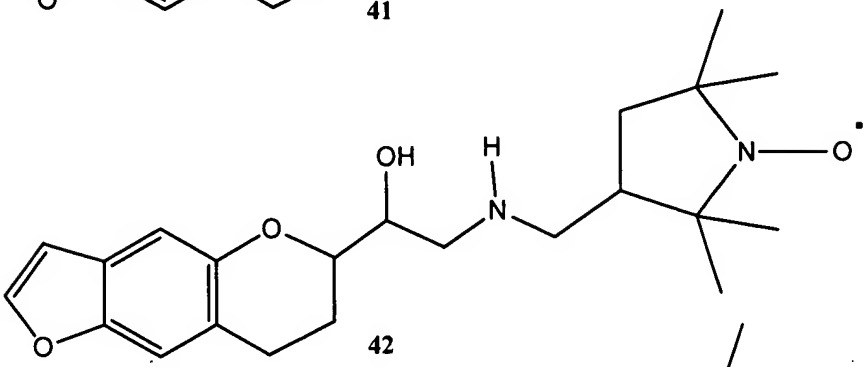

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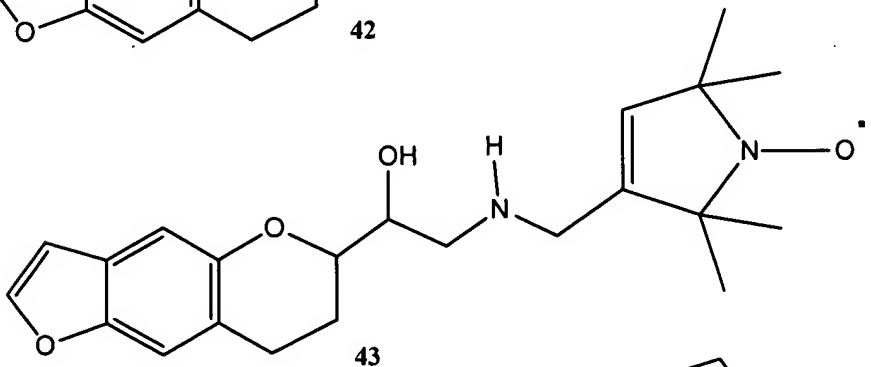

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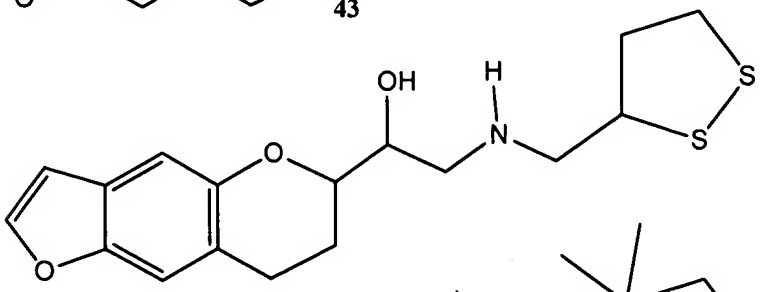

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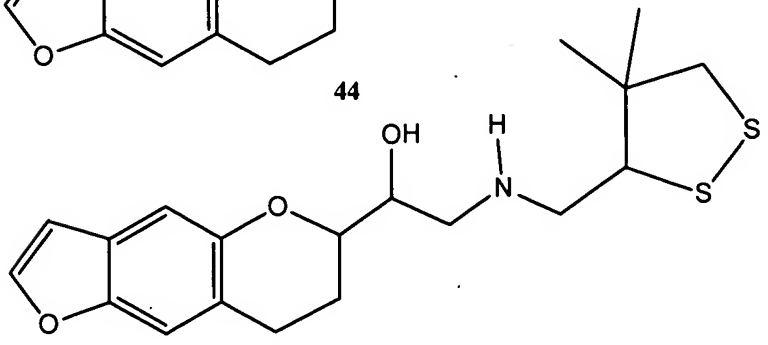

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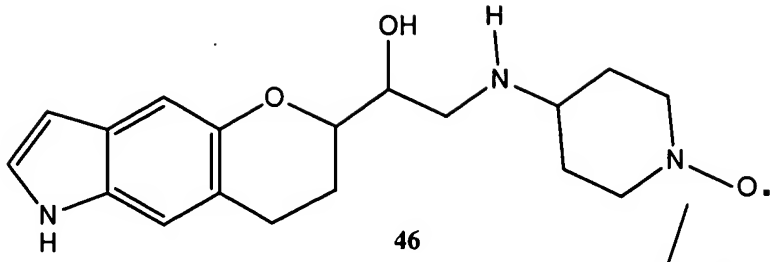

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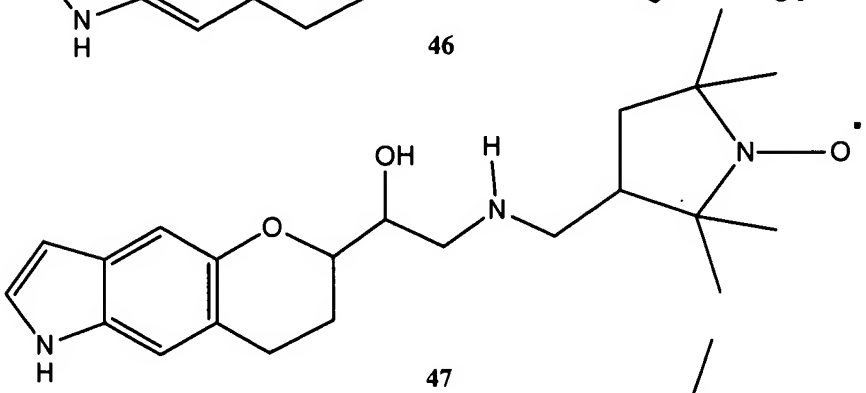

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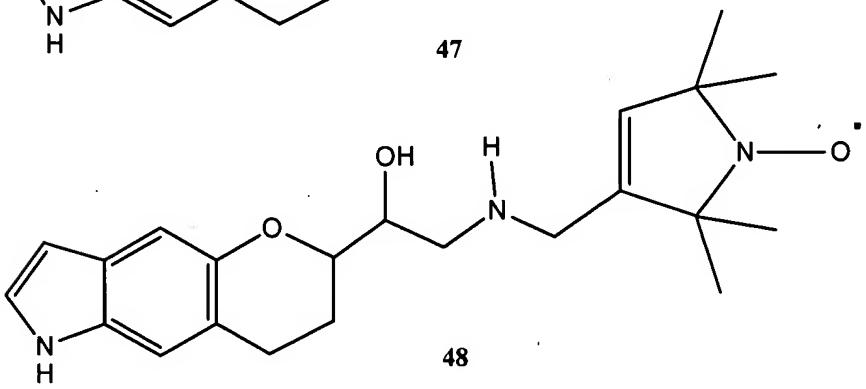

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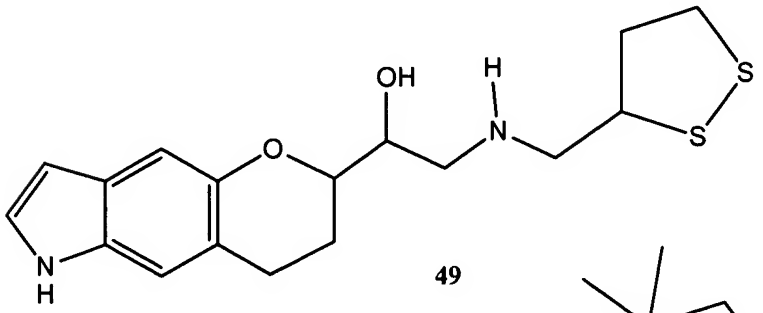

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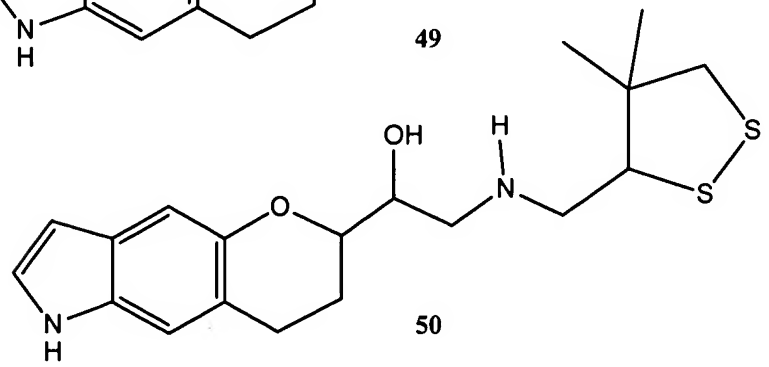

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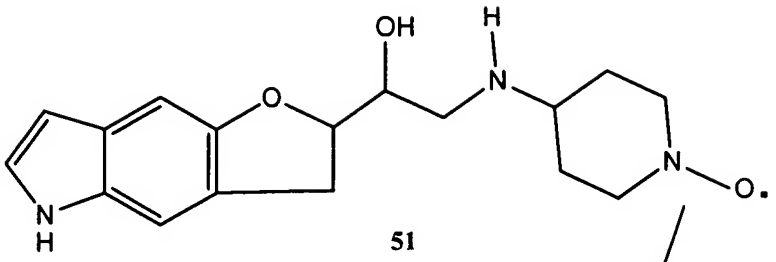

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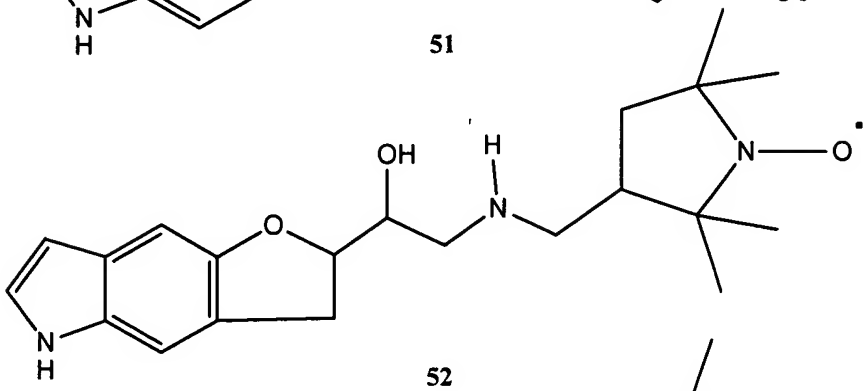

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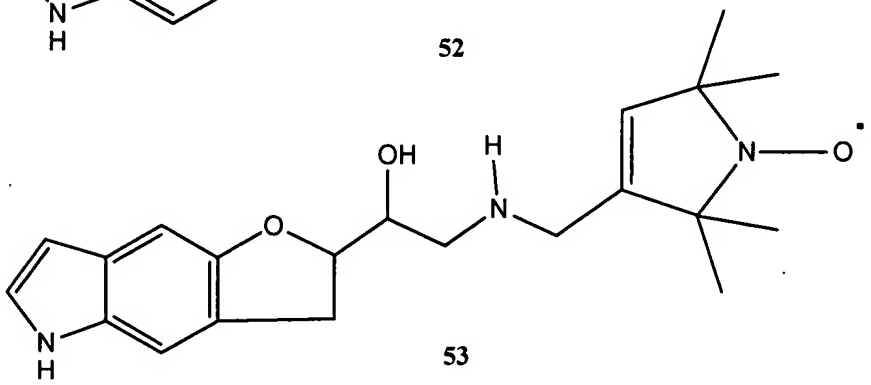

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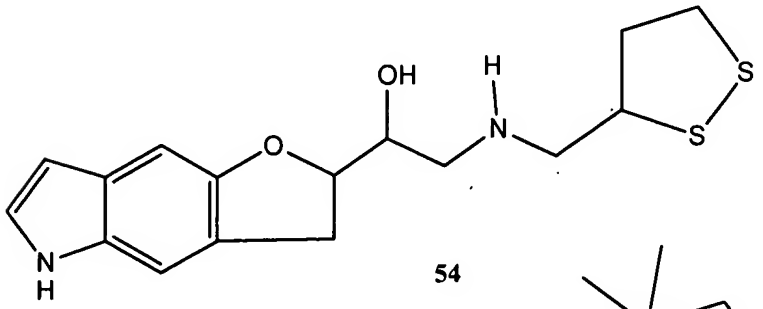

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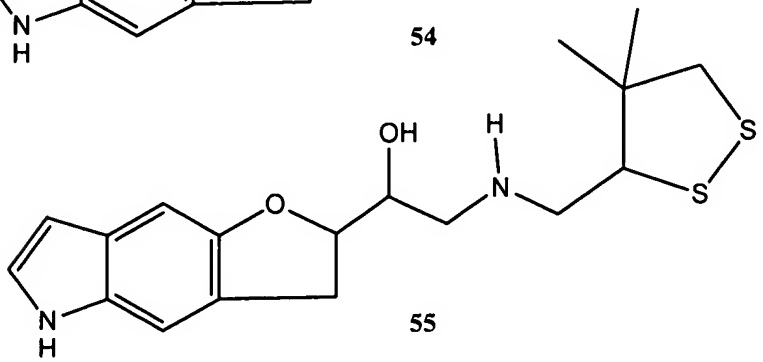

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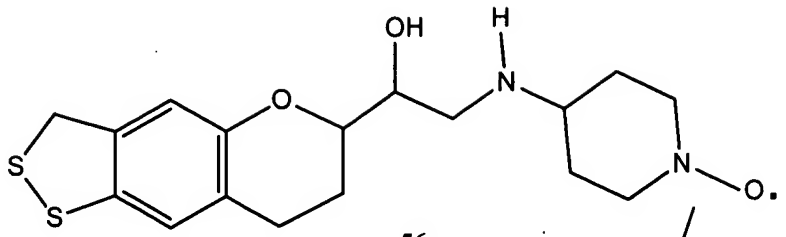

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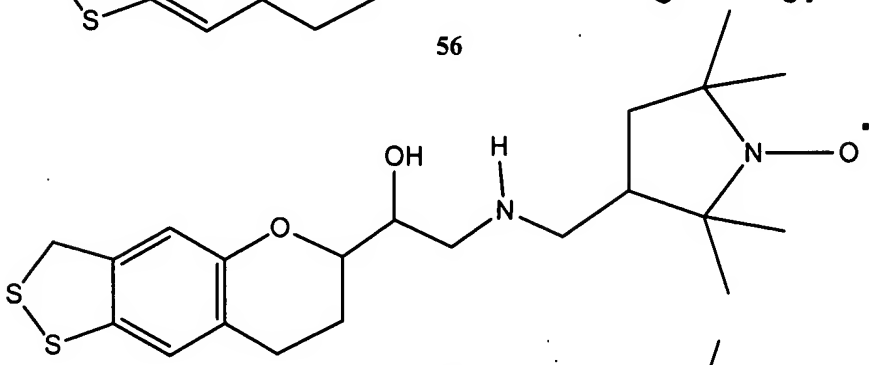

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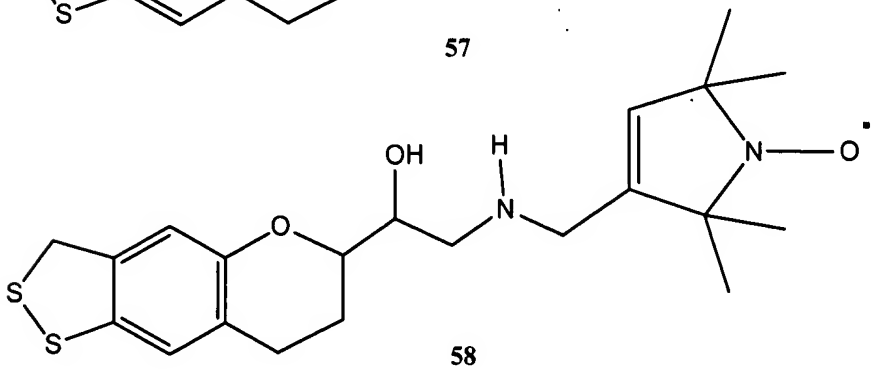

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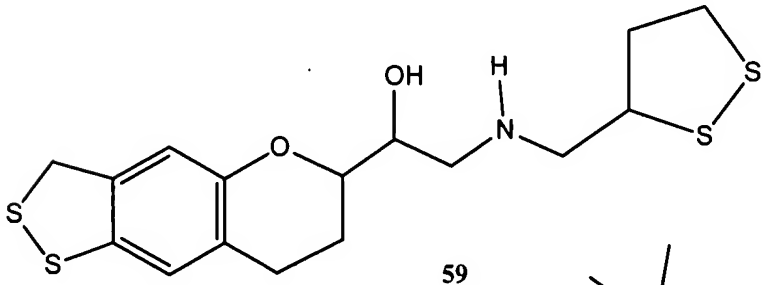

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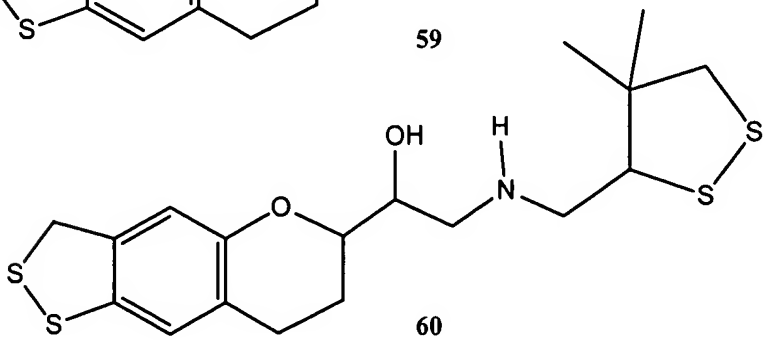

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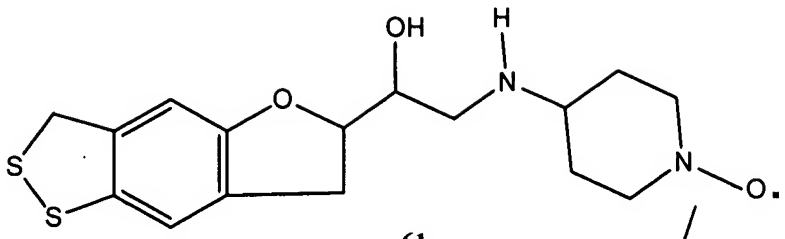

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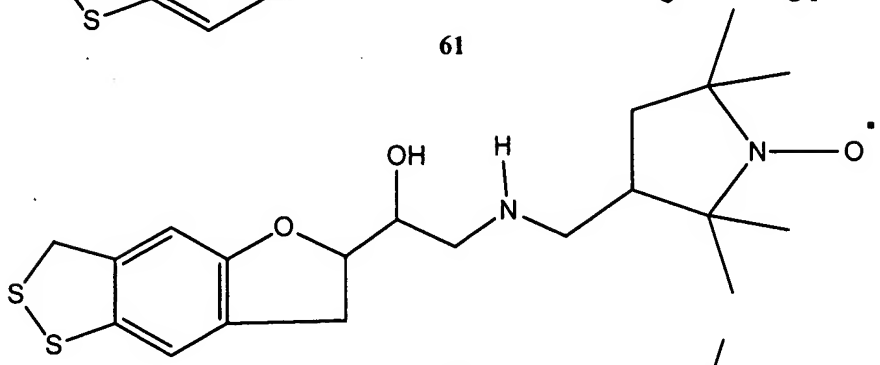

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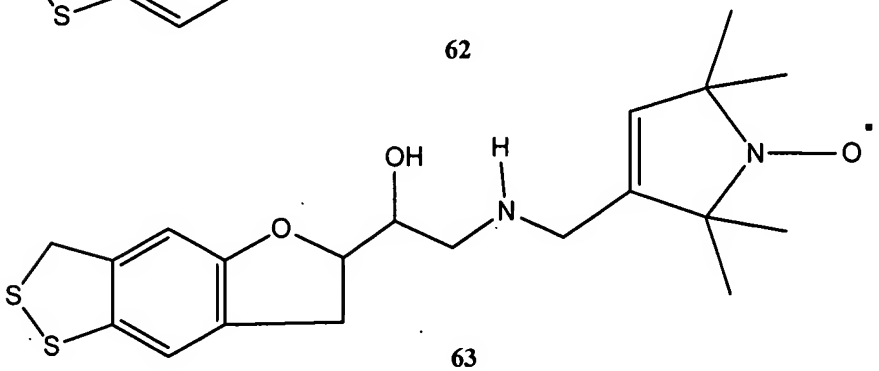

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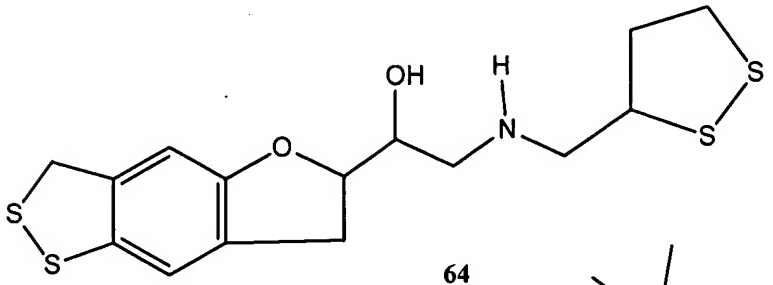

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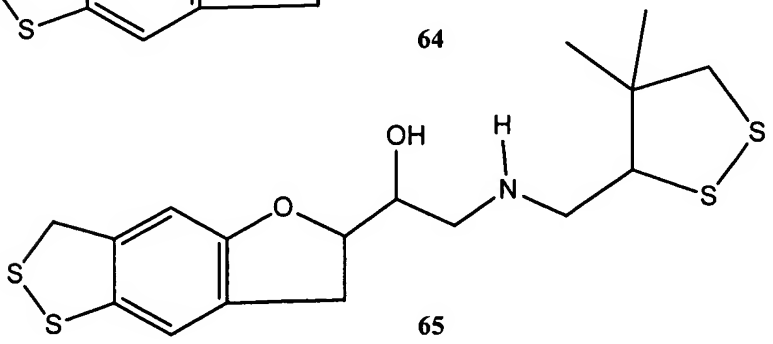

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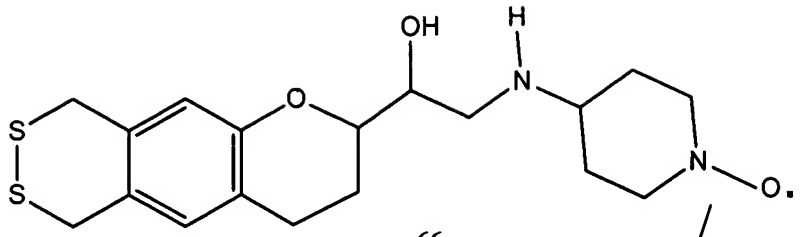

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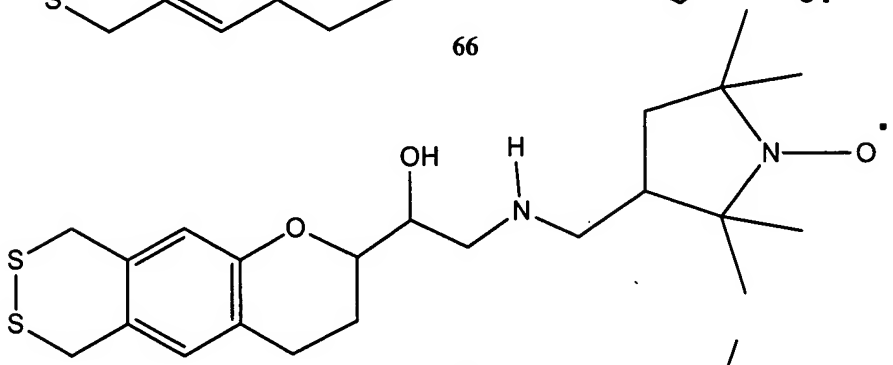

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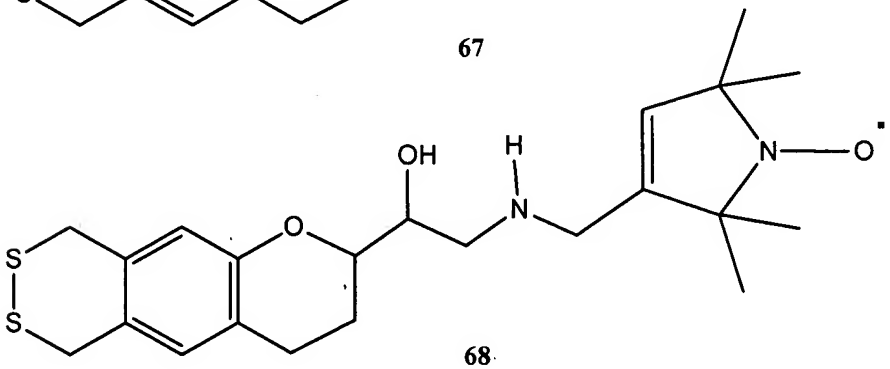

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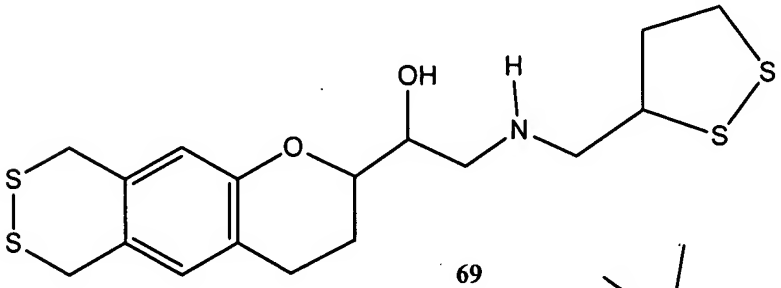

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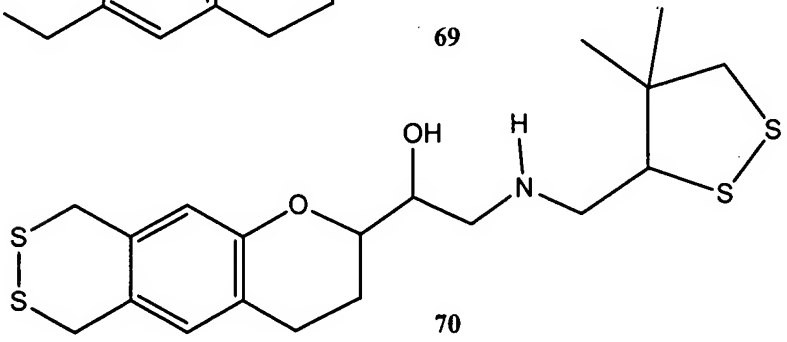

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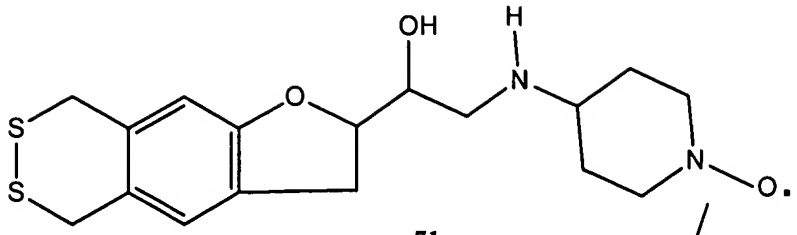

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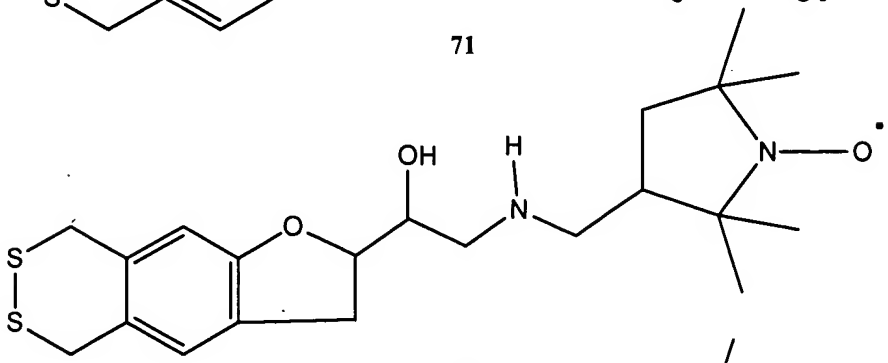

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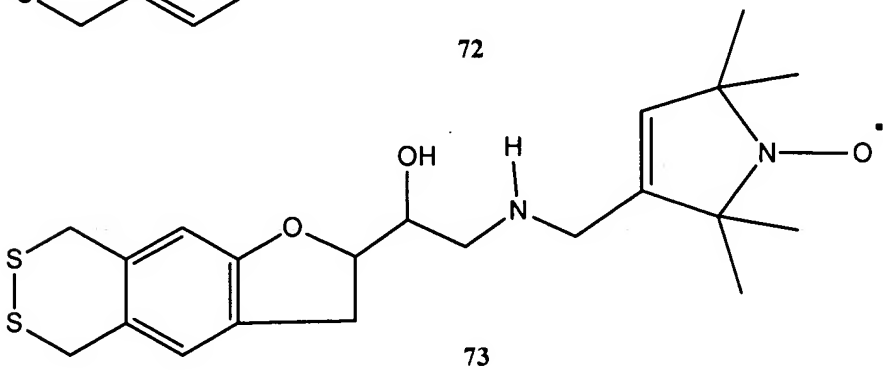

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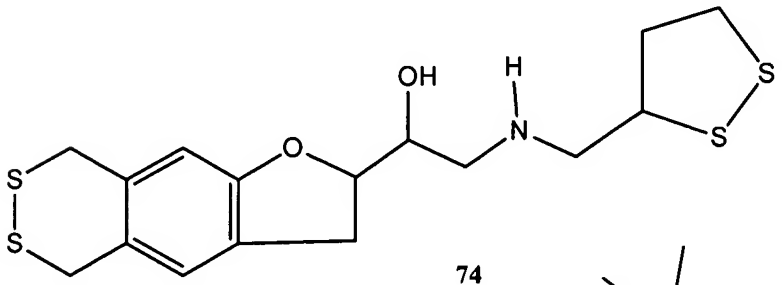

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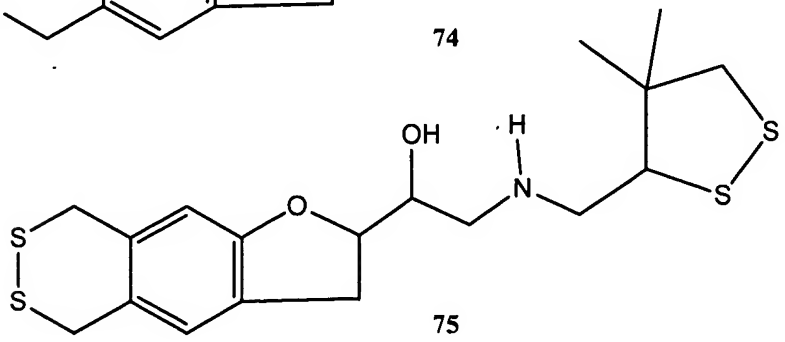

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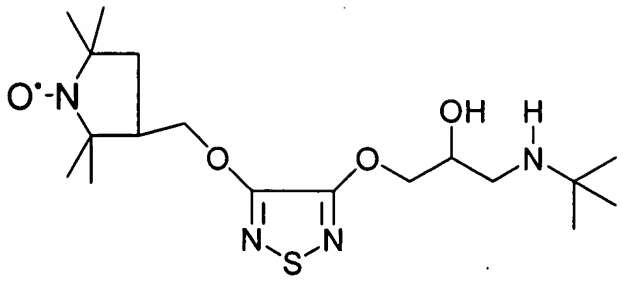

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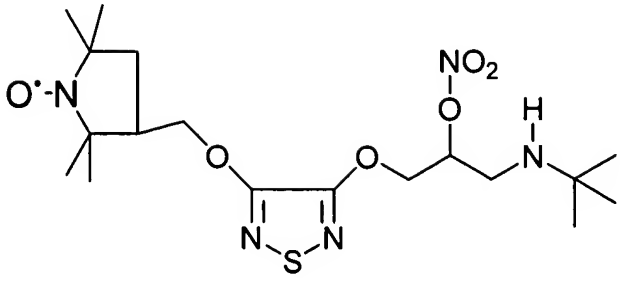

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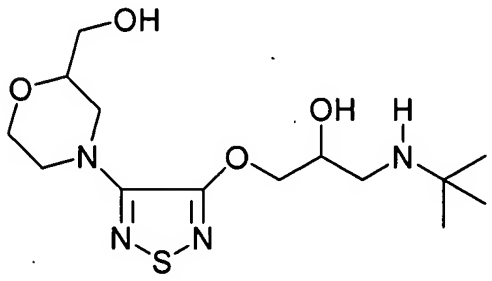

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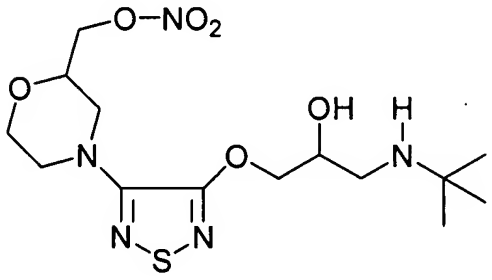

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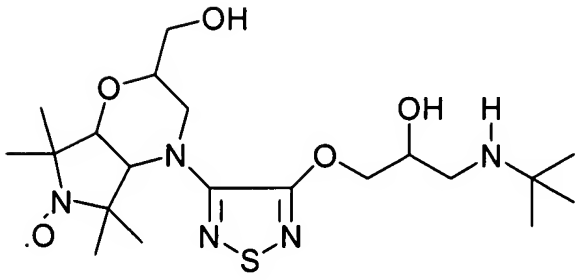

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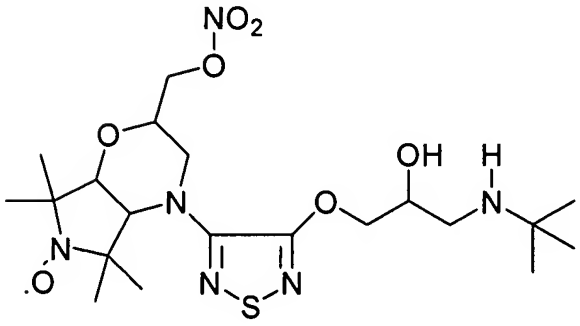

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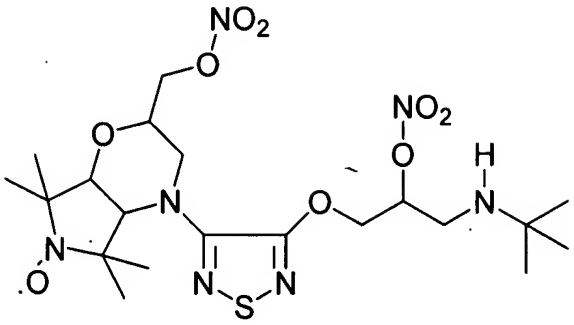

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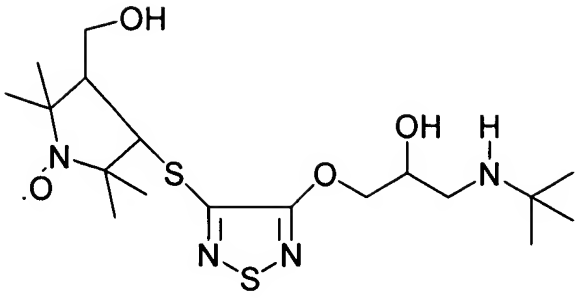

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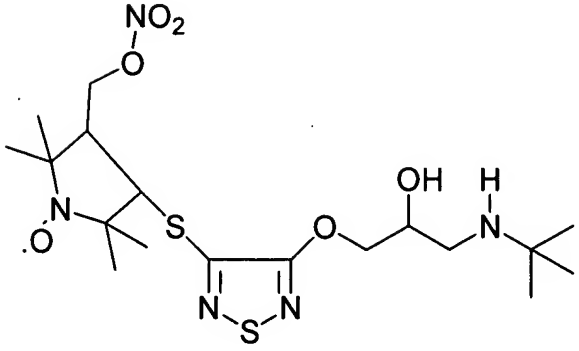

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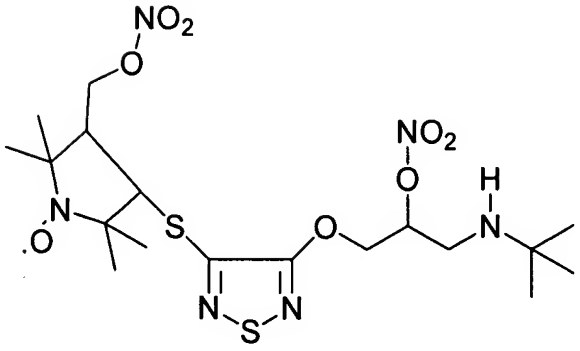

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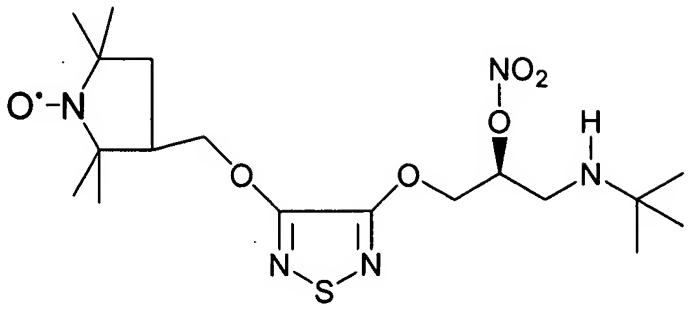

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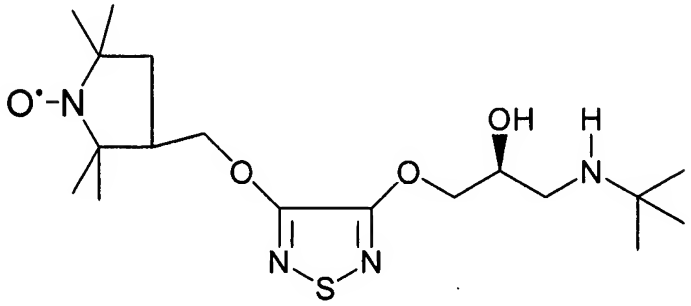

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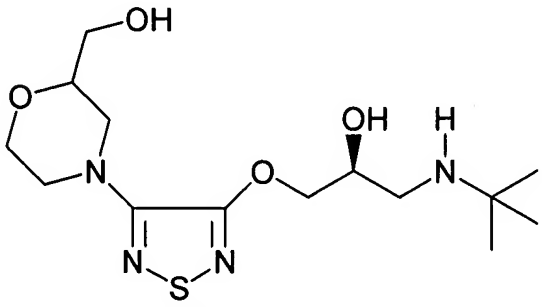

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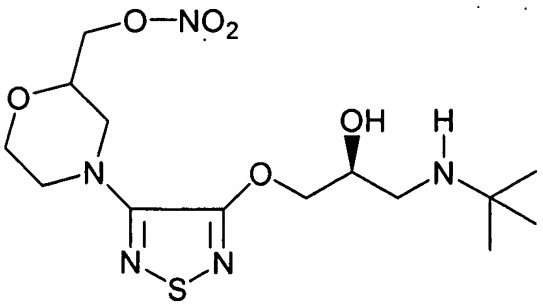

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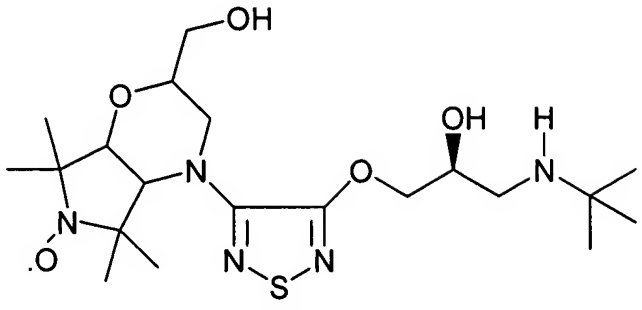

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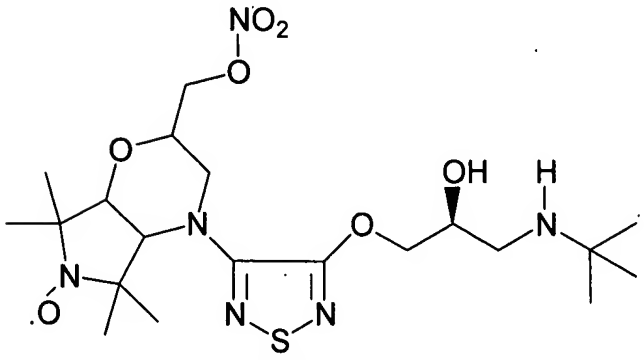

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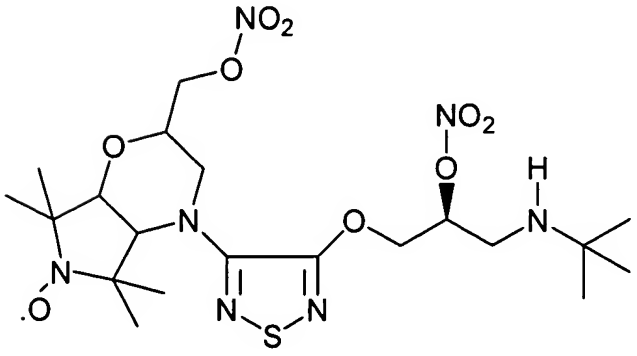

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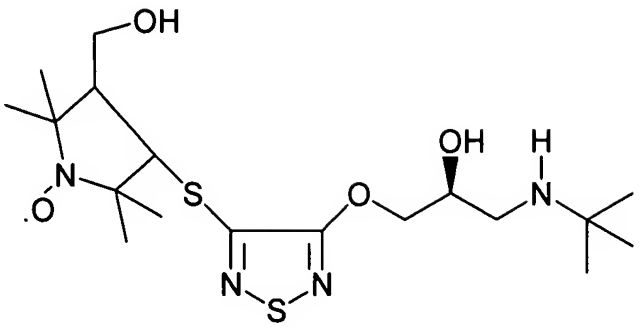

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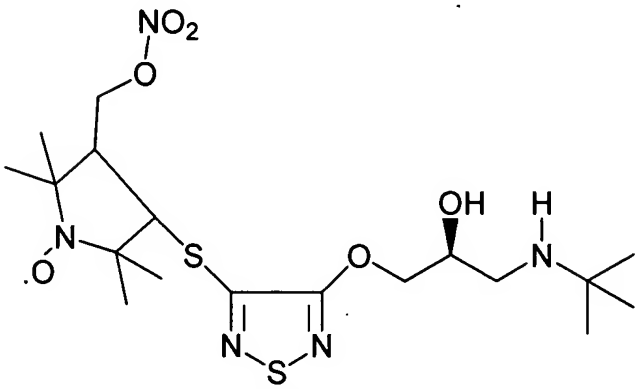

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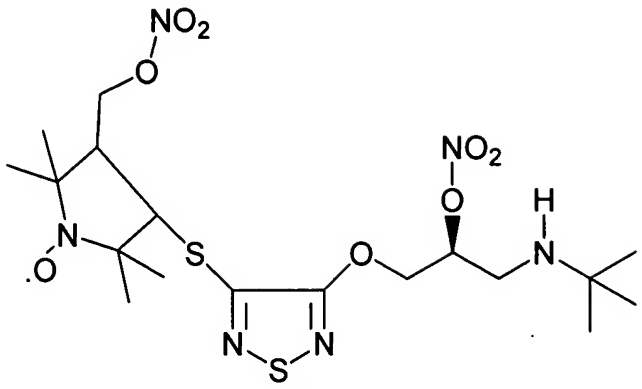


16'

Claim 74 (new): A method according to claim 51, wherein said administration or treatment is selected from the group consisting of topical, oral, and parenteral.

Claim 75 (new): A method according to claim 51, wherein said administration or treatment is selected from the group consisting of suppository, by way of injection, and by way of infusion.

Claim 76 (new): A method according to claim 51, wherein said multifunctional β-blocker compound is administered by a route selected from intramuscular, intraperitoneal, intravenous, ICV, intracisternal injection or infusion, subcutaneous injection, implant, inhalation spray, nasal, vaginal, rectal, sublingual, and urethral.

Claim 77 (new): A method according to claim 1, wherein said mammal is human.

Claim 78 (new): A multifunctional β-adrenergic receptor antagonist compound comprising

i) a β-blocker component,

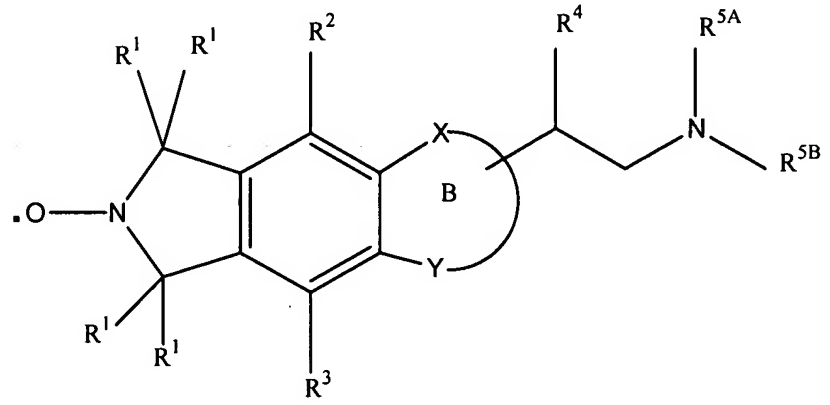
ii) at least one ROS-scavenger component,

and

iii) at least one NO-donor component.

Claim 79 (new): A multifunctional antagonist according to claim 78, wherein said ROS-scavenger component comprises N-oxide free radical, wherein the nitrogen of said N-oxide free radical is within a 3-, 4-, 5-, 6- or 7-membered ring, wherein the ring may be substituted or unsubstituted with straight or branched alkyl groups, alkoxy groups or groups capable of donating NO.

Claim 80 (new): A multifunctional antagonist according to claim 78, wherein said compound has Formula I



wherein R^1 may be independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted aryl, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

R^2 and R^3 may be independently hydrogen or $(CH_2)_nX^1$, n being from 0 to 4, and X^1 being H, OH, =O (where n is not 0) or a group capable of donating NO, or

R^2 and R^3 may be independently selected from H, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted

or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted aryl, and substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO;

R^4 may be $(CH_2)_mX^2$, m being from 0 to 4, and X^2 being H, SH, OH, =O (where m is not 0) or a group capable of donating NO, or R^4 may be H, SH, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycle, wherein the optional substituent may bea group capable of donating NO;

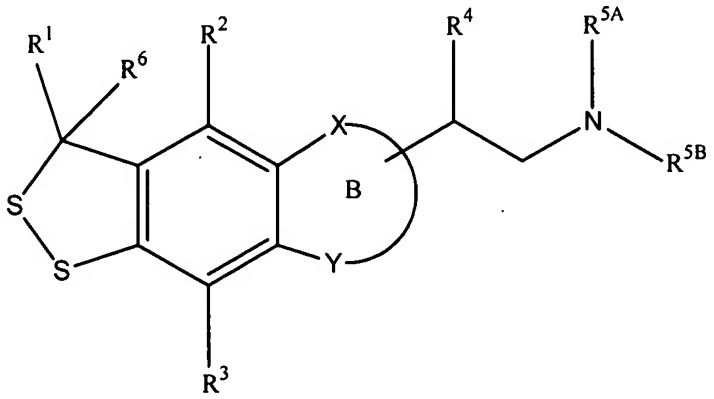
R^{5A} and R^{5B} may be, independently, $(CH_2)_p X^3$, p being from 0 to 4, and X^3 being H, OH, =O (where p is not 0) or a group capable of donating NO, or R^{5A} and R^{5B} may be, independently, H, OH, =O, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycle, wherein the optional substituent may bea group capable of donating NO;

and wherein

X and Y may independently be –CH=CH-, $(CH_2)_q$ while q is from 0 to 3, O, S, NH, CH_2, or NR^7, wherein R^7 may be hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted

aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO, and where ring B is a 5-, 6- or 7-membered ring.

Claim 81 (new): A multifunctional antagonist according to claim 78, wherein said compound has Formula II



wherein R^1 and R^6 may be independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy, substituted or unsubstituted aryl, or substituted or unsubstituted heterocycle, wherein the optional substituent may be a group capable of donating NO;

R^2 and R^3 may be independently hydrogen, or $(CH_2)_nX^1$ while n being from 0 to 4, and X^1 being H, OH, =O (where n is not 0) or a group capable of donating NO, or R^2 and R^3 may be independently H, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aryloxy,substituted or

unsubstituted aryl, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

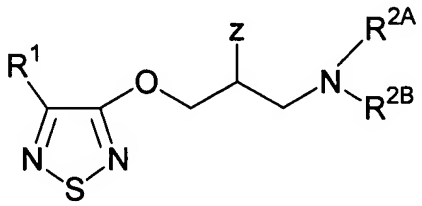
R^4 may be $(CH_2)_mX^2$ while m being from 0 to 4, and X^2 being H, SH, OH, =O (where m is not 0) or a group capable of donating NO, or R^4 may be H, SH, OH, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO;

R^{5A} and R^{5B} may be, independently, $(CH_2)_p X^3$ while p being from 0 to 4, and X^3 being H, OH, =O (where p is not 0) or a group capable of donating NO, or R^{5A} and R^{5B} may be, independently, H, OH, =O, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, or substituted or unsubstituted heterocycles, wherein the optional substituent may be a group capable of donating NO; and

X and Y may independently be –CH=CH-, $(CH_2)_q$ while q being from 0 to 3, O, S, NH, CH_2, or NR^7, wherein R^7 may be hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkynyl, substituted or unsubstituted acyl, substituted or unsubstituted acyloxy, substituted or unsubstituted aminoalkyl, substituted or unsubstituted alkoxy, substituted or unsubstituted arylamine, substituted or unsubstituted arylsulphide, substituted or

unsubstituted arylsulphone, substituted or unsubstituted arylsulfurdioxide, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted or unsubstituted heterocycles; wherein the optional substituent may be a group capable of donating NO; and wherein ring B is a 5-, 6- or 7-membered ring.

Claim 82 (new): A multifunctional antagonist according to claim 78, wherein said compound has Formula IA

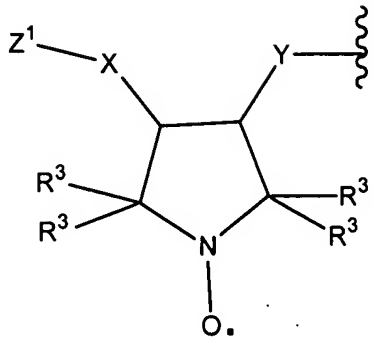


wherein R^1 is a group comprising a substituted N-oxide free radical, wherein the N-oxide free radical is contained within a 5- or 6-membered ring, and optionally further comprises a group capable of donating NO, or R^1 is a group selected from IIA, IIIA, IVA, and VA as shown below, where the groups of Formulae IIA-VA are linked to Formula IA at position R^1, through substituent Y of Formulae IIA-VA;

Z is halo, nitrato, nitroso, nitrile, hydroxyl, thiol, sulfonamido, amino, guanadino, isoguanadino, cyano, isocyano, and carboxyl; and

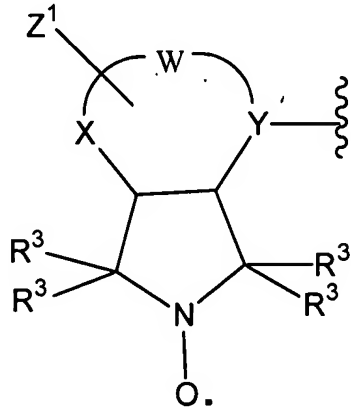
R^{2A} and R^{2B} are independently hydrogen, =O, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, phenyl, substituted phenyl or heterocyclyl, wherein the optional substitution comprises one or more groups capable of donating NO group, or one or more groups being ROS scavengers; and wherein

IIA has structure



in which R^3 is independently hydrogen or C_1-C_4 alkyl;
Y is selected from $(CH_2)_n$ while n being from 0 to 3, O, NH, S, substituted or unsubstituted acyl, acyloxy, alkynyl, alkene, alkyl, alkoxy, aryloxy, arylamine, arylsulphide, arylsulphone, or arylsulfurdioxide; X is selected from $(CH_m)_p$ while m being 2 or 3 and p from 0 to 3, O, -N=N-, S, NH, CH_3N-, substituted or unsubstituted acyl, acyloxy, alkynyl, alkene, alkyl, alkoxy, aryloxy, arylamine, arylsulphide, arylsulphone, arylsulfurdioxide; and Z^1 is H OH, ONO, ONO_2, SNO;

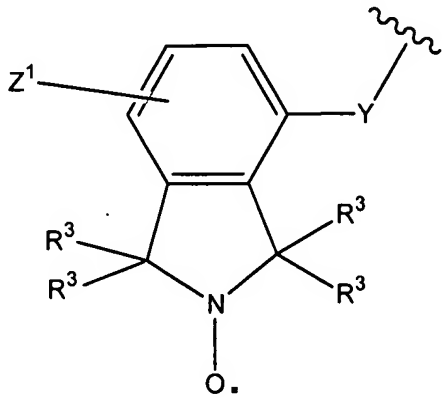
IIIA has structure



in which R^3 is independently hydrogen or C_1-C_4 alkyl;

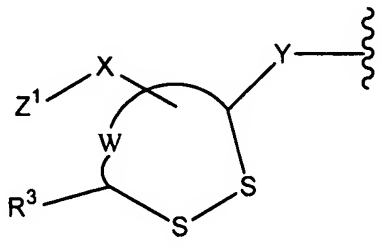
W is is $(CH_m)_n$ while m being from 0 to 2 and n being from 0 to 3, where W may be substituted or unsubstituted.; X is selected from (CH_p) while p 1 or 2, O, -N=N-, S, and NH, or X is absent; Y is (CH) or N; and Z^1 is selected from H, OH, CH_2ONO, CH_2CH_2ONO, CH_2ONO_2, $CH_2CH_2ONO_2$, ONO, ONO_2, SNO, and NONOate; wherein IIIA may include 1-3 Z^1 substituents on the ring to which Z^1 is attached;

IVA has structure



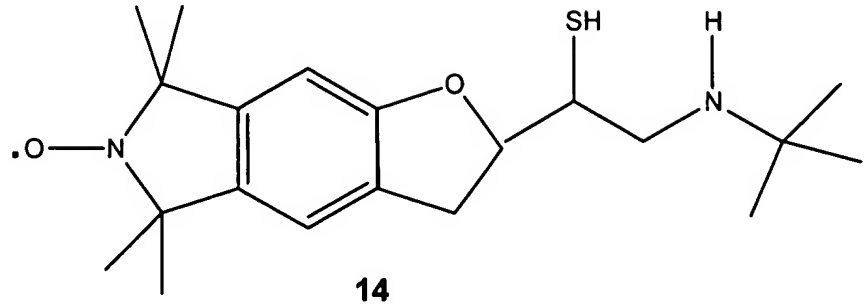
in which R^3 may be independently hydrogen or C_1-C_4 alkyl; Y may be CH_2, O, NH, S, substituted or unsubstituted alkylene, or it can be absent; Z^1 may be CH_2ONO, CH_2CH_2ONO, CH_2ONO_2, $CH_2CH_2ONO_2$, NO, NO_2, ONO, ONO_2, SNO, or OH, wherein IVA may include 1-3 of the Z^1 substituents on the ring to which Z^1 is attached;

VA has structure



in which R^3 is hydrogen or C_1-C_4 alkyl; W is $(CH_m)_n$ while m being from 0 to 2 and n being from 0 to 3, where W can be substituted or unsubstituted; X is selected from (CH_p) while p being 1 or 2, O, -N=N-, S, NH, CH_3N-,and substituted or unsubstituted alkylene, or X is absent; Y is selected from CH_2, O, NH, S or substituted or unsubstituted alkylene, or Y is absent; and Z^1 is OH, ONO, ONO_2, $N(NO)_2$, or SNO..

Claim 83 (new): A mulrifunctional agonist according to claim 78, wherein said compound is selected from the group consisting of compounds nos. 14, 15, 20-75, 1', 2', and 7'-24' as shown below:



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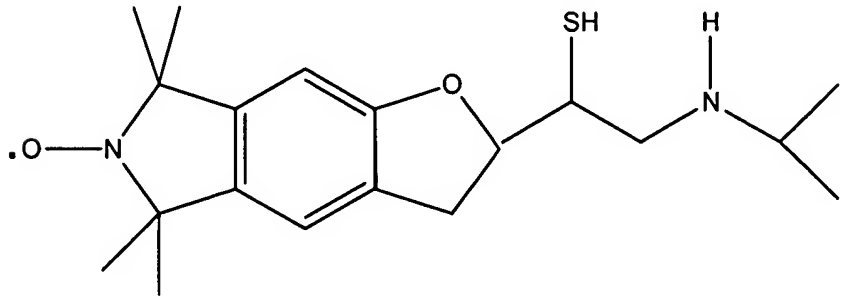

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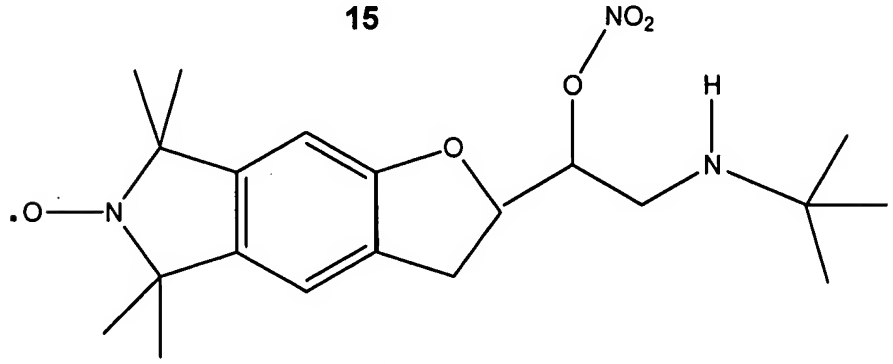

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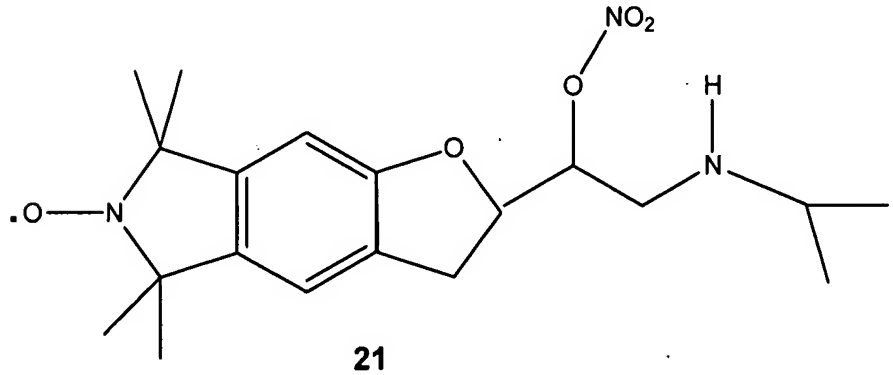

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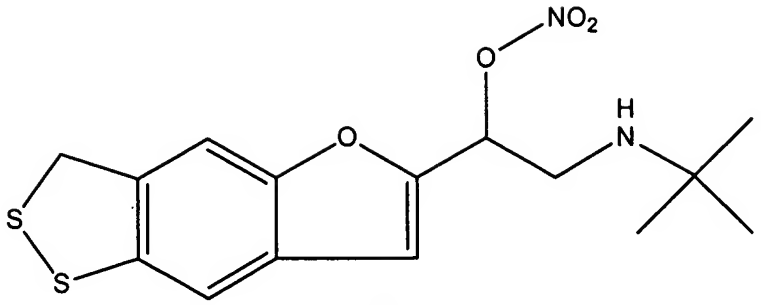

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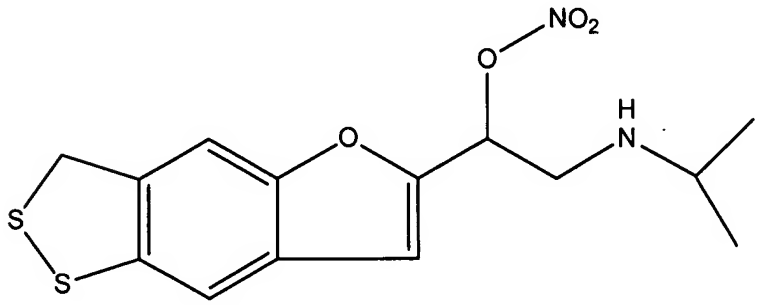

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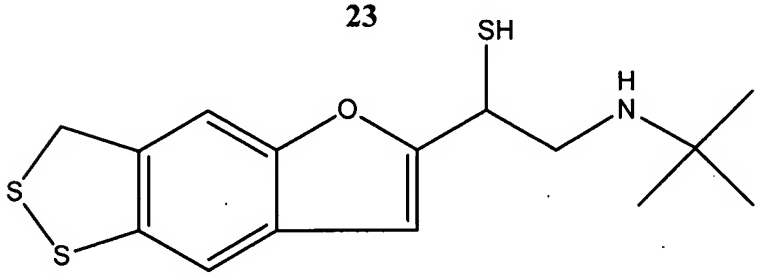

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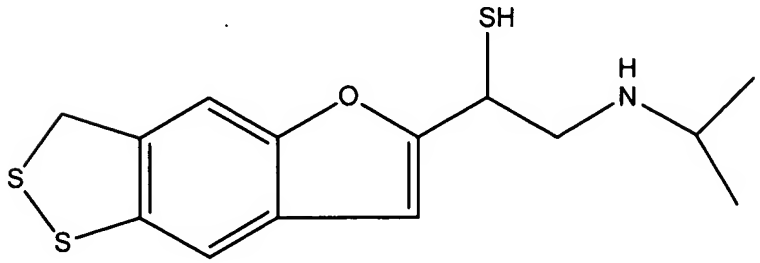

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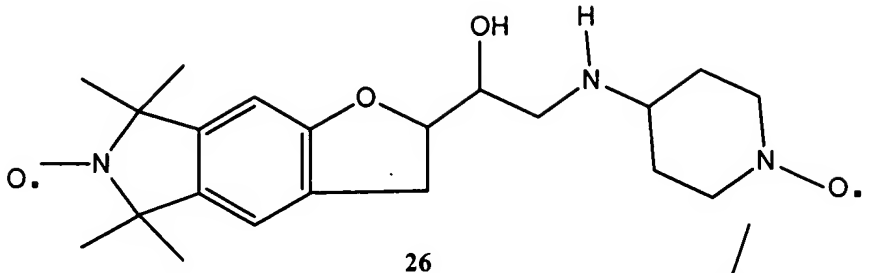

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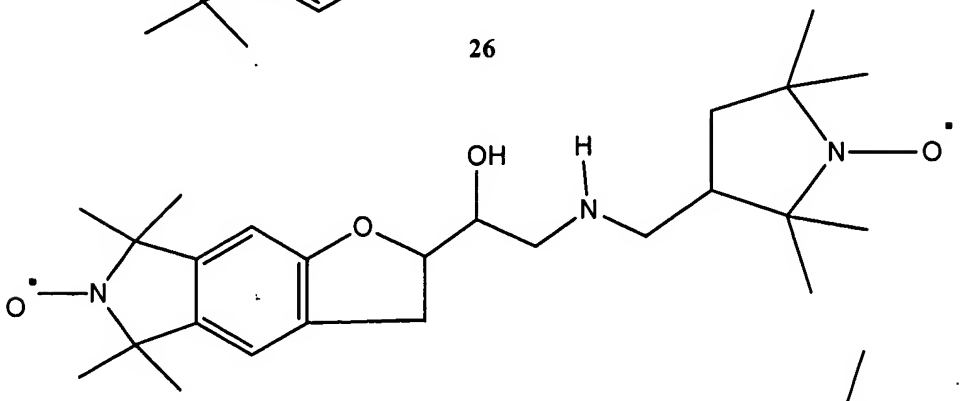

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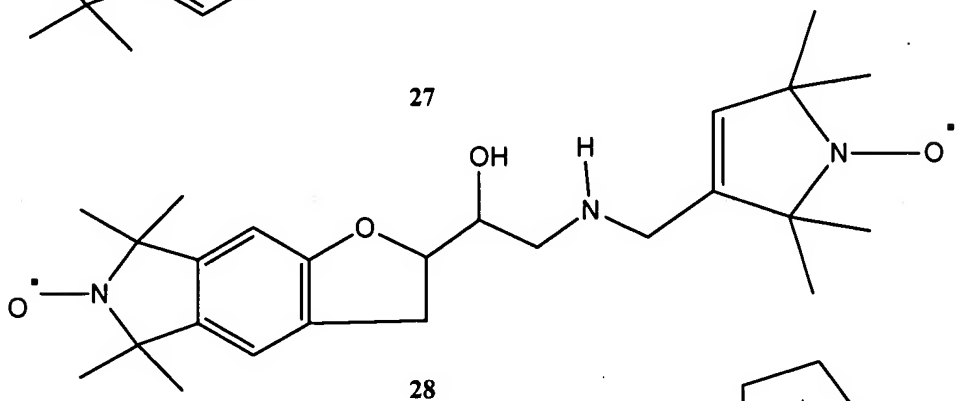

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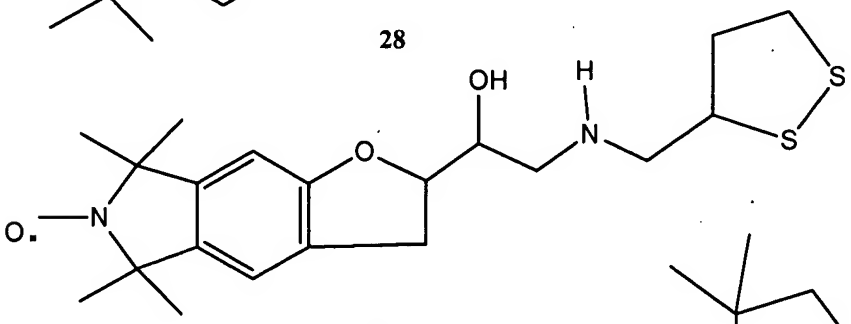

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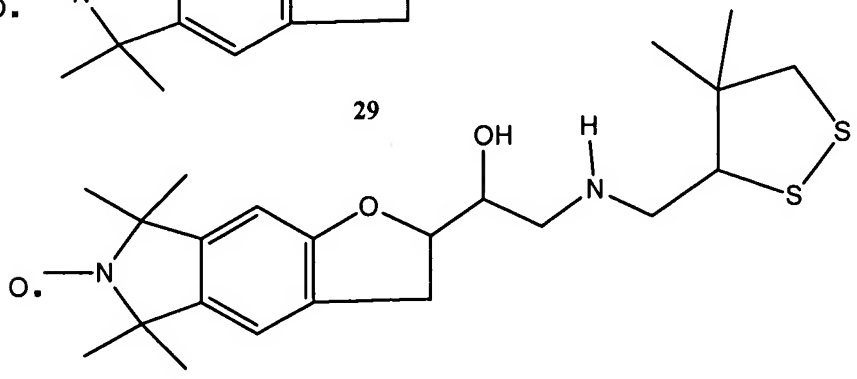

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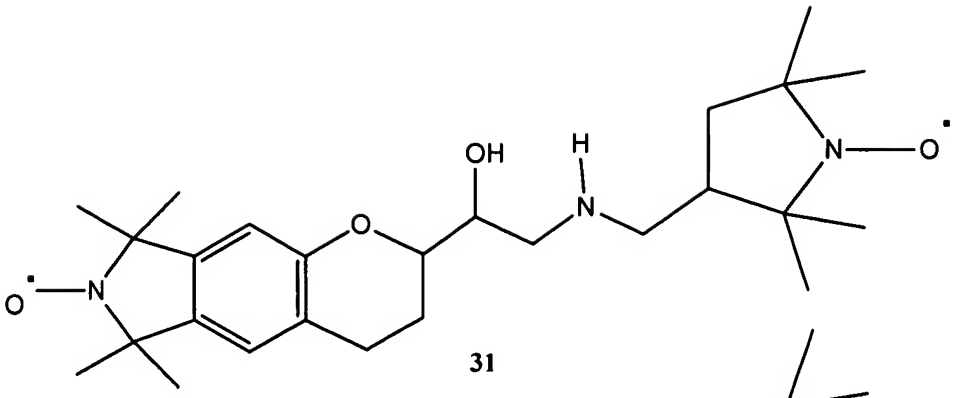

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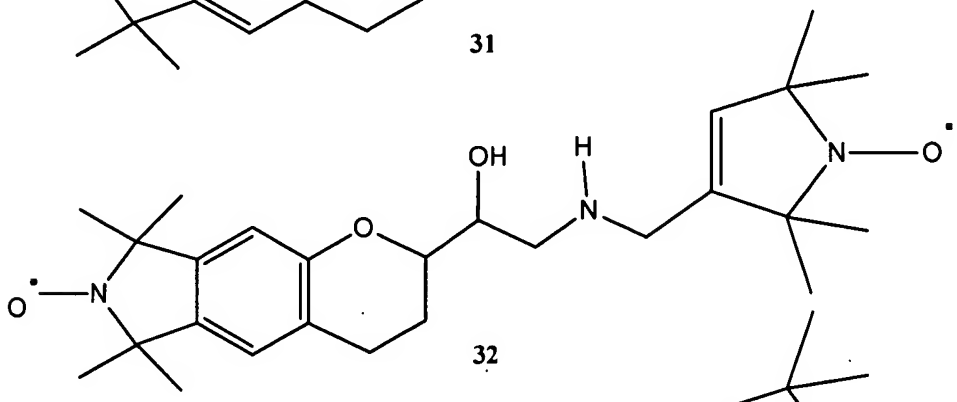

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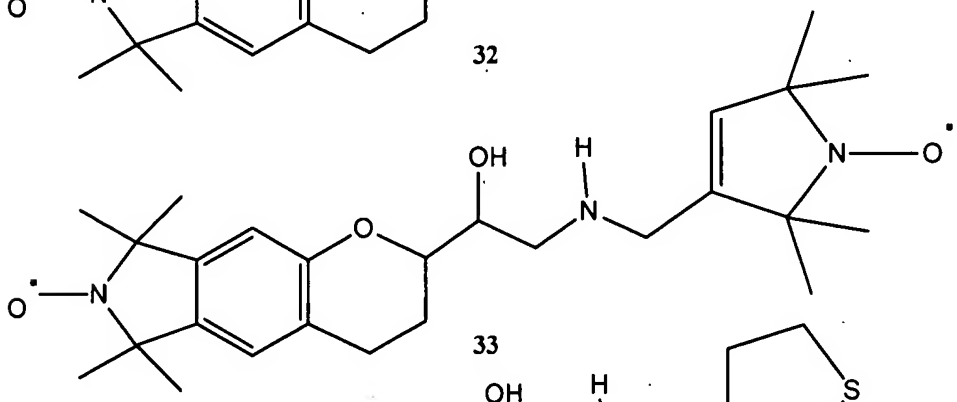

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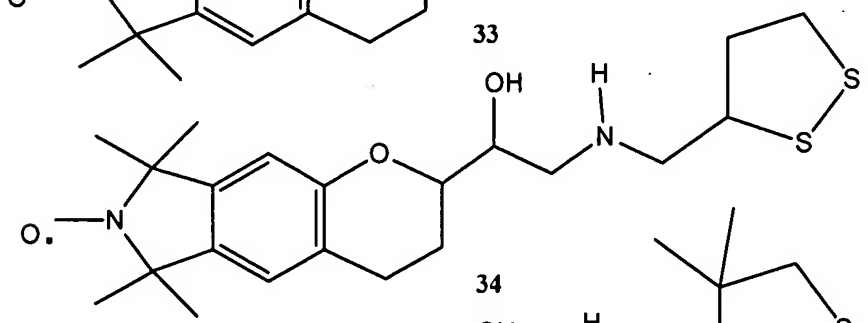

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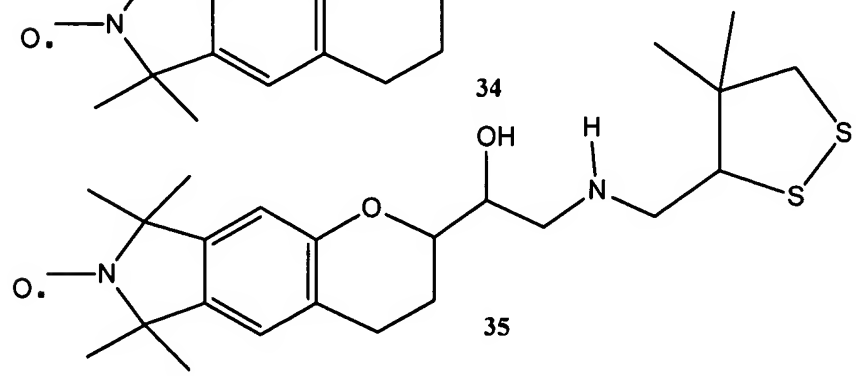

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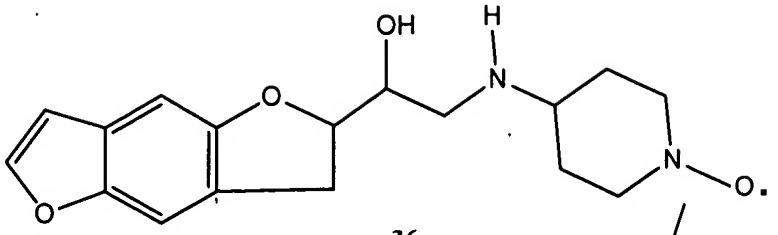

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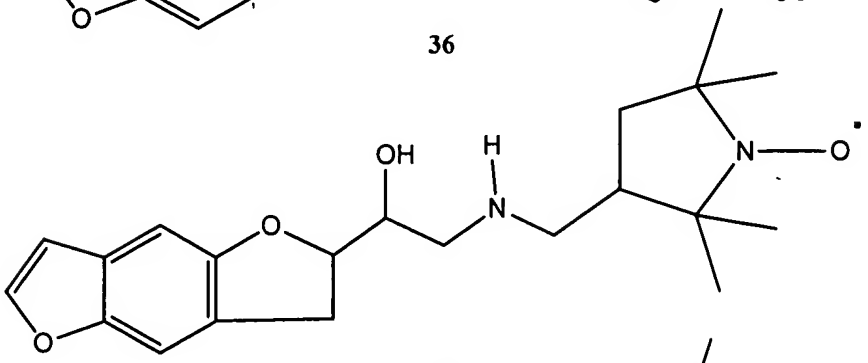

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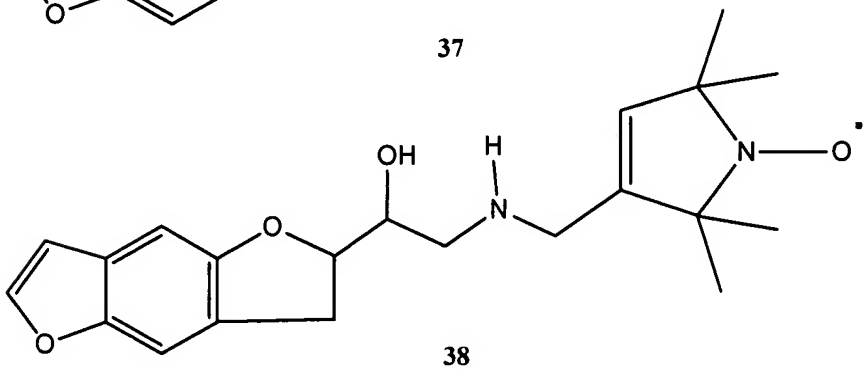

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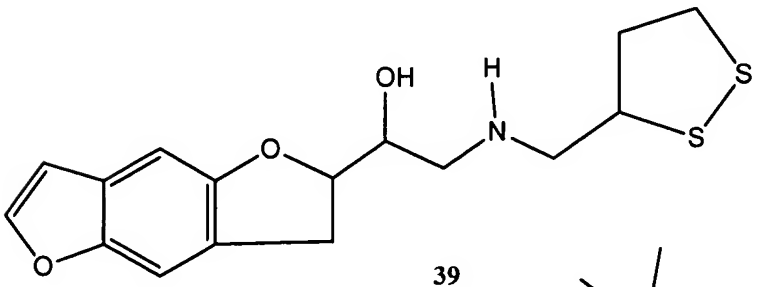

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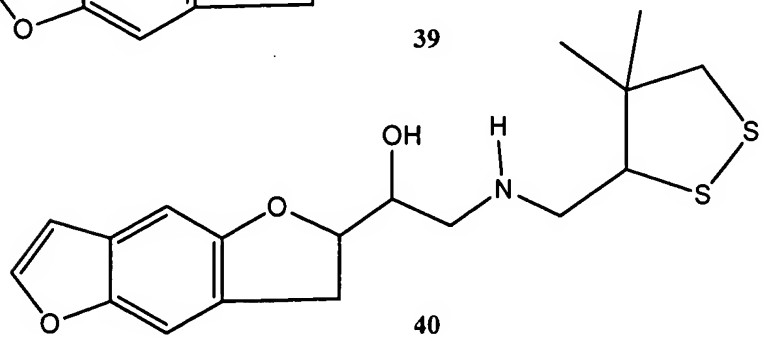

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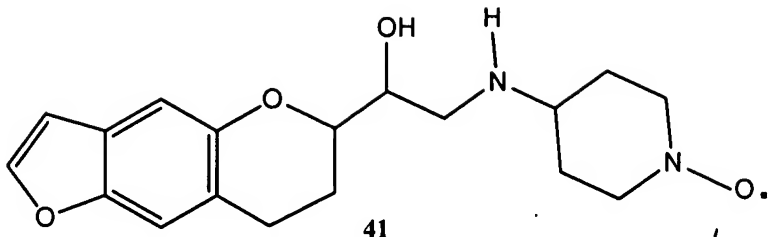

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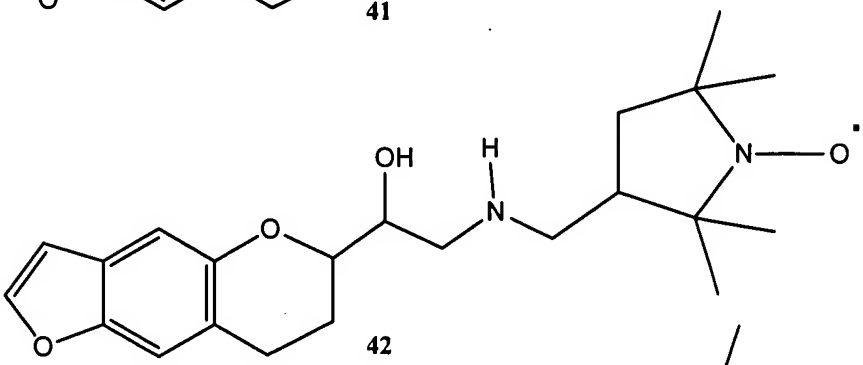

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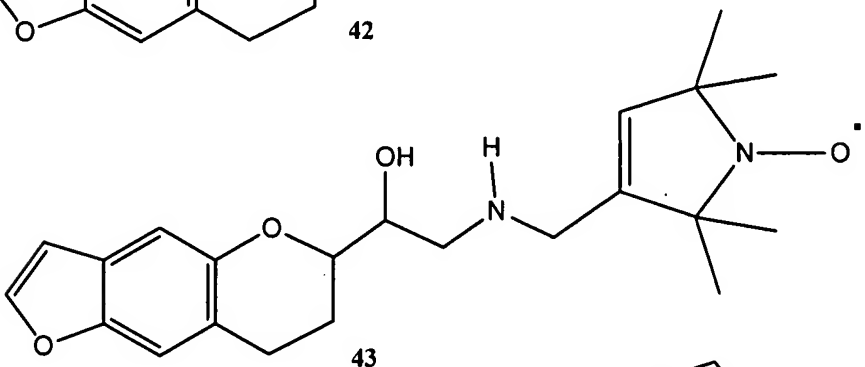

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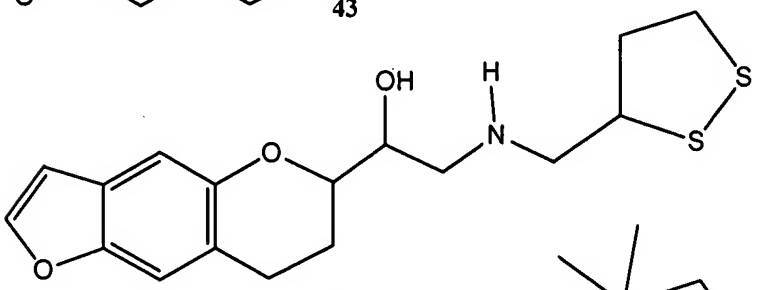

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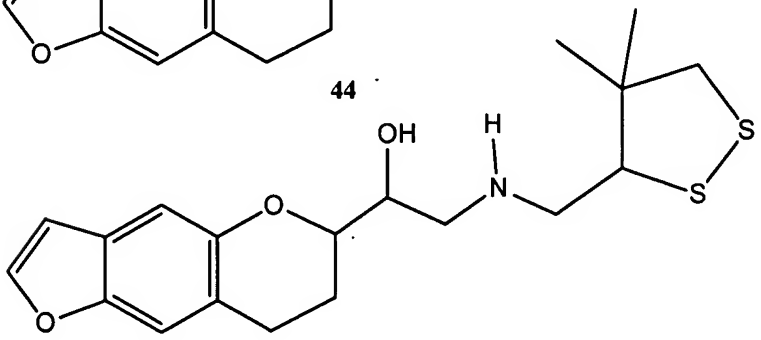

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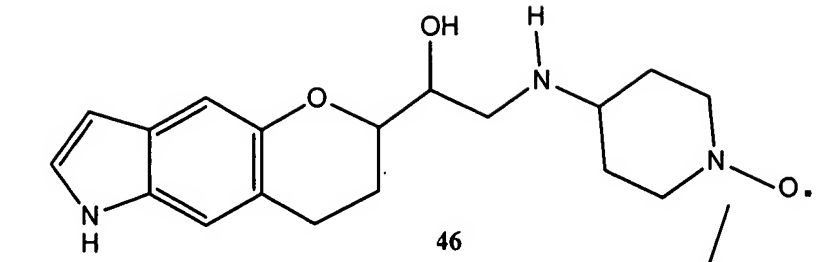

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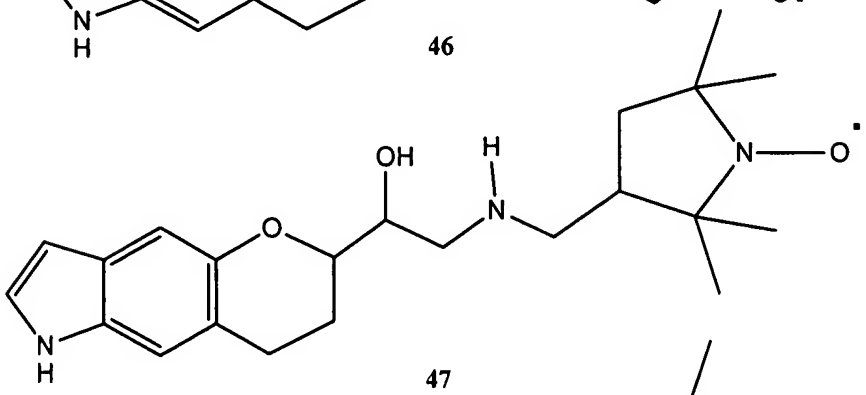

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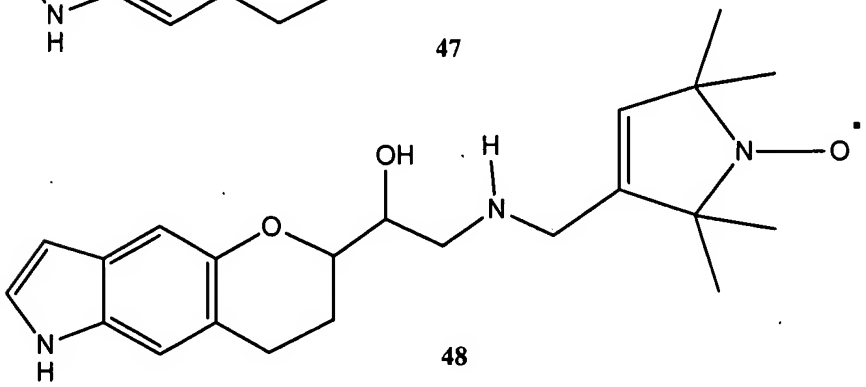

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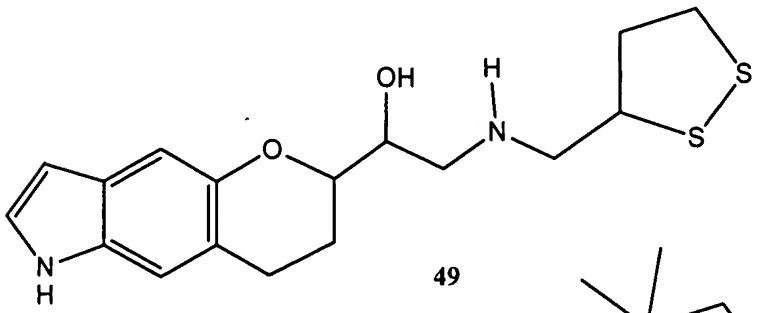

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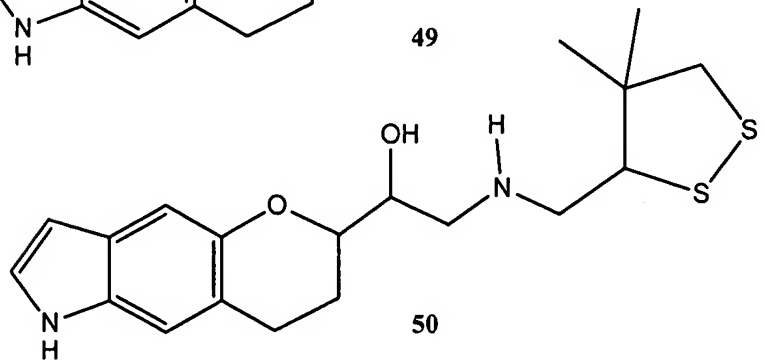

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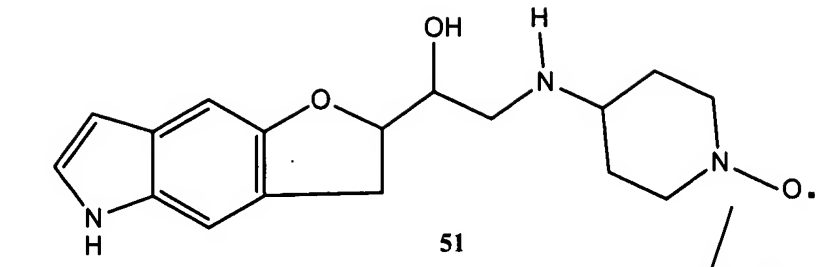

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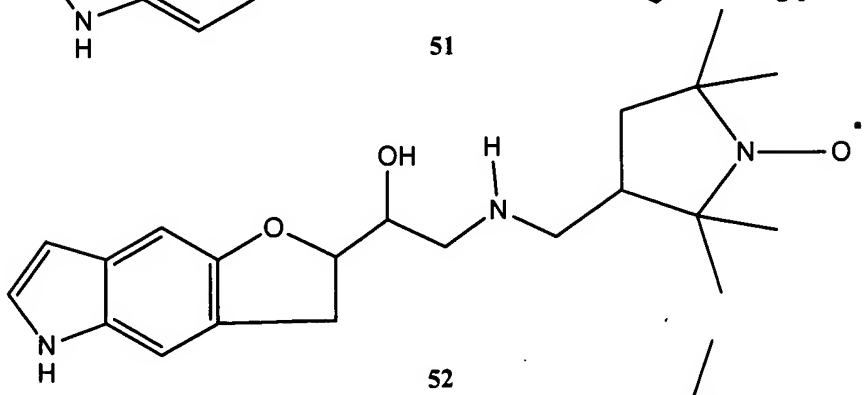

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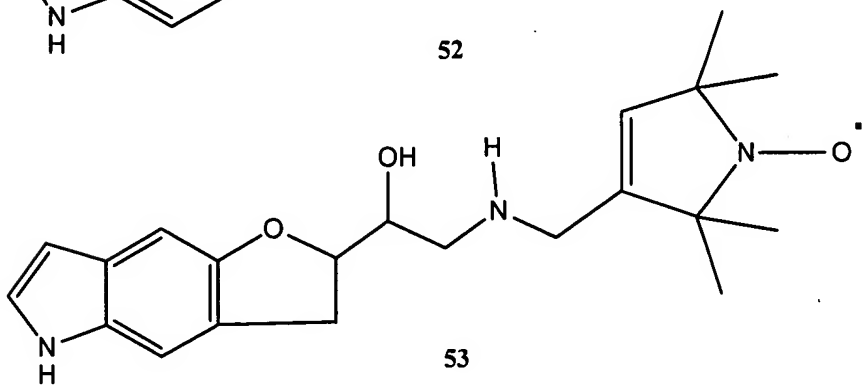

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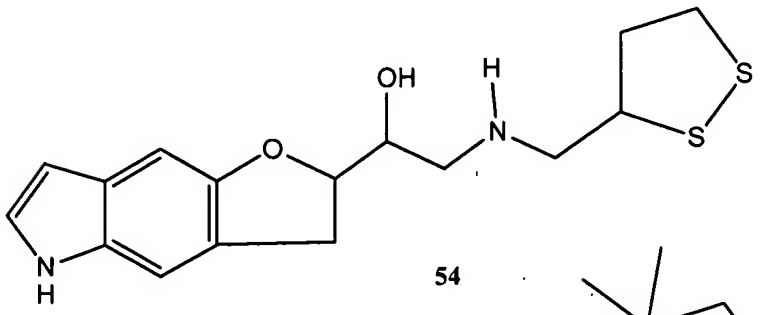

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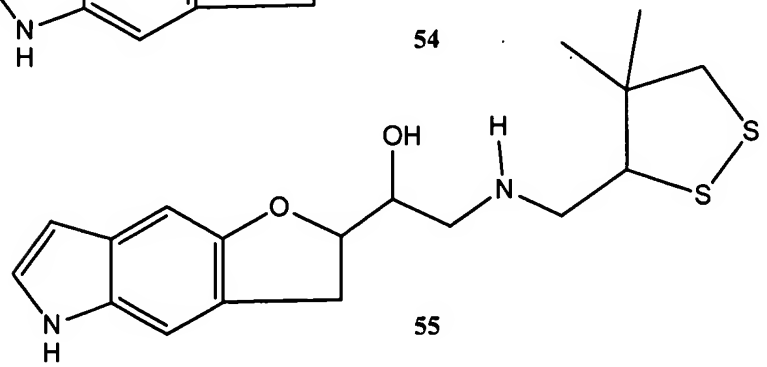

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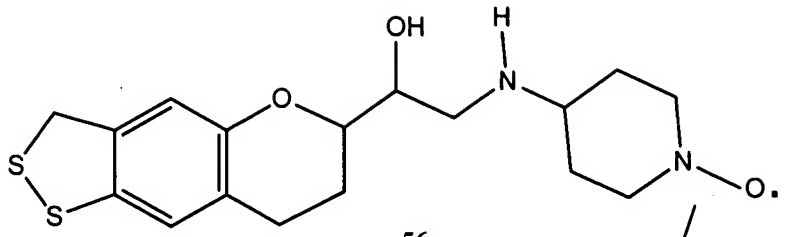

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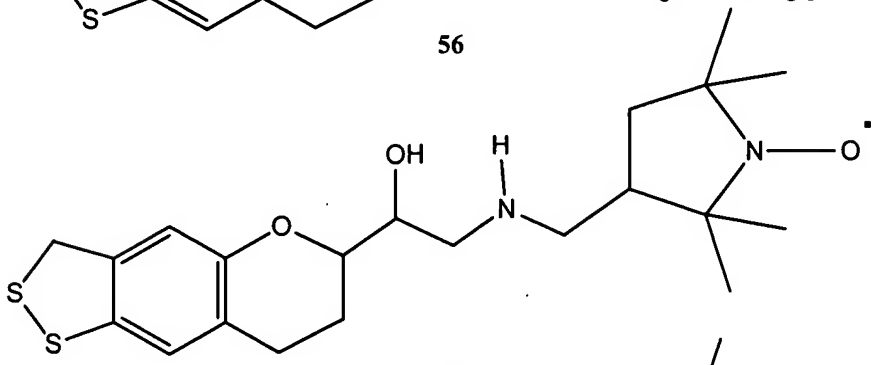

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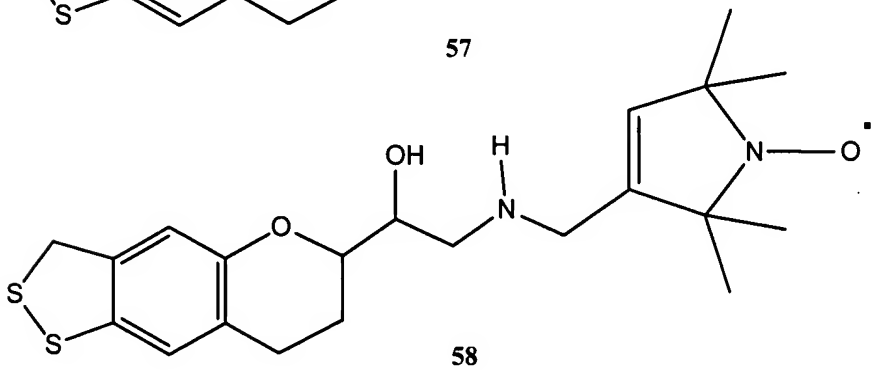

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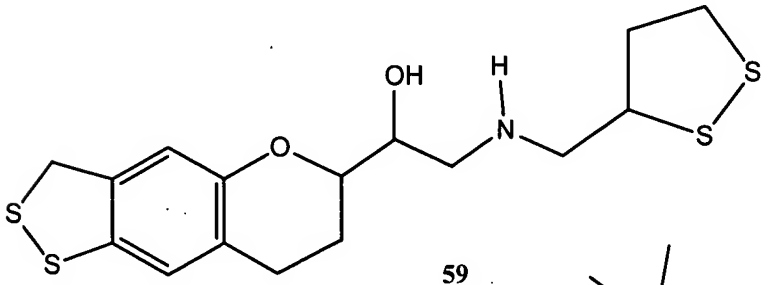

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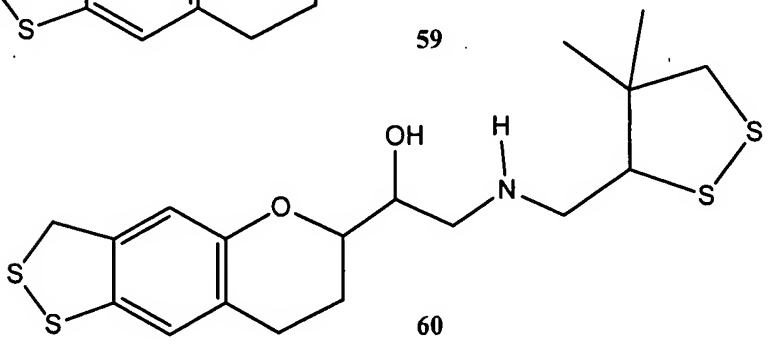

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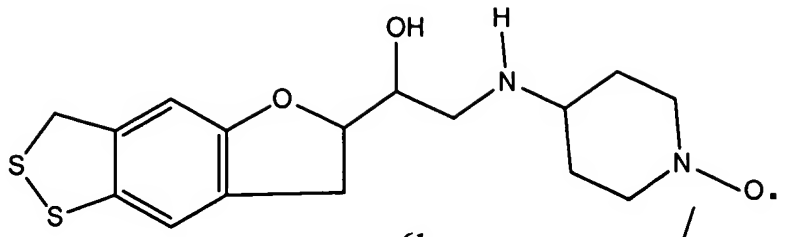

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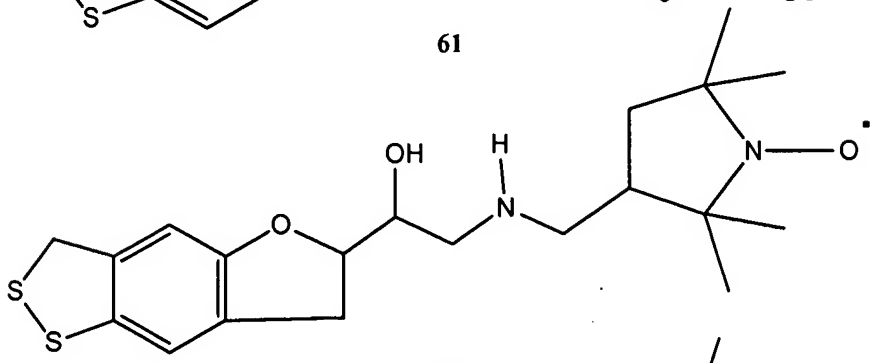

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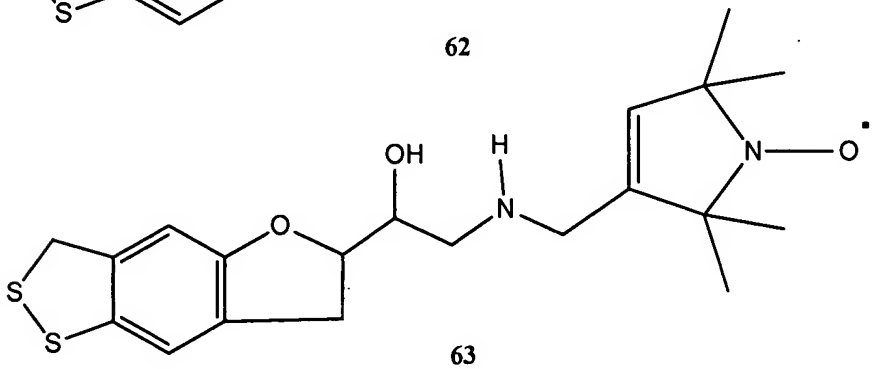

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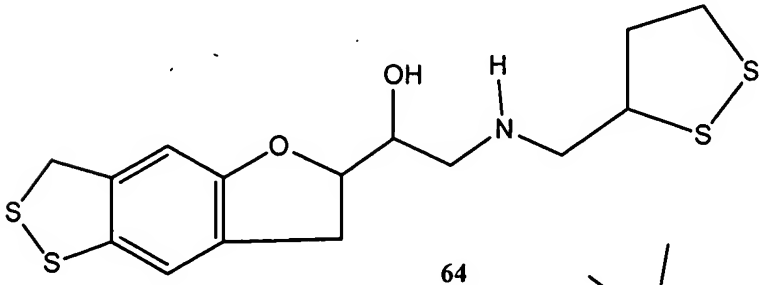

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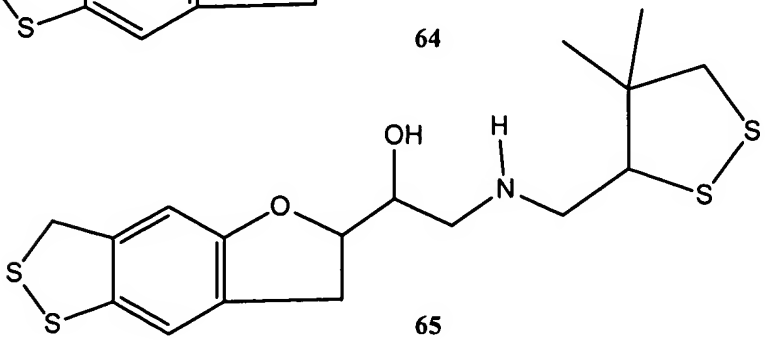

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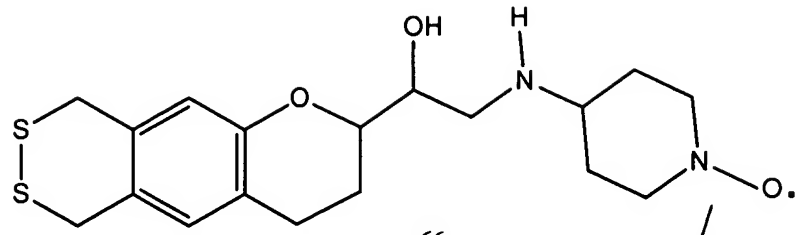

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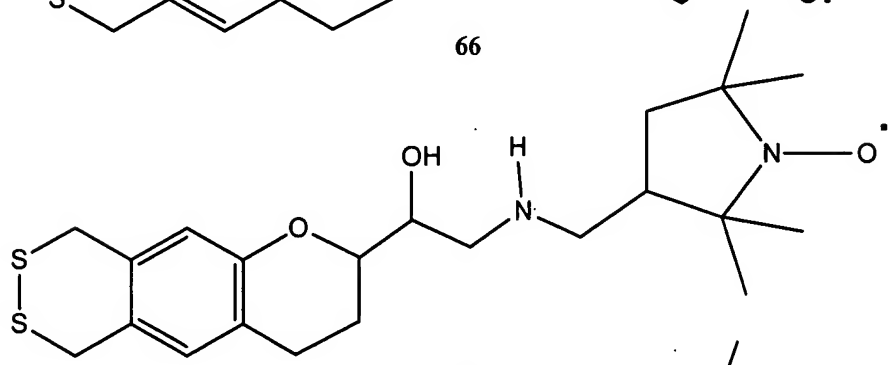

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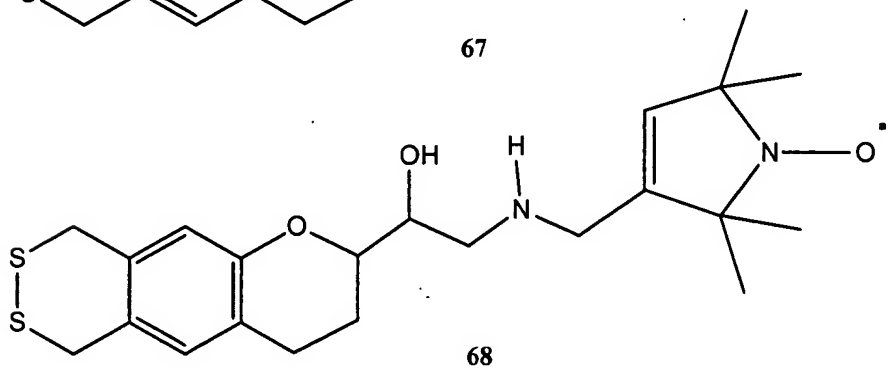

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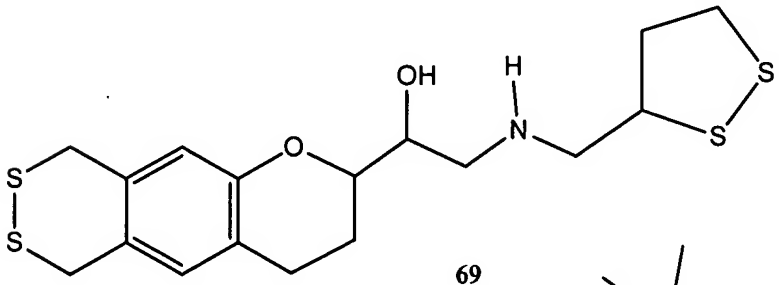

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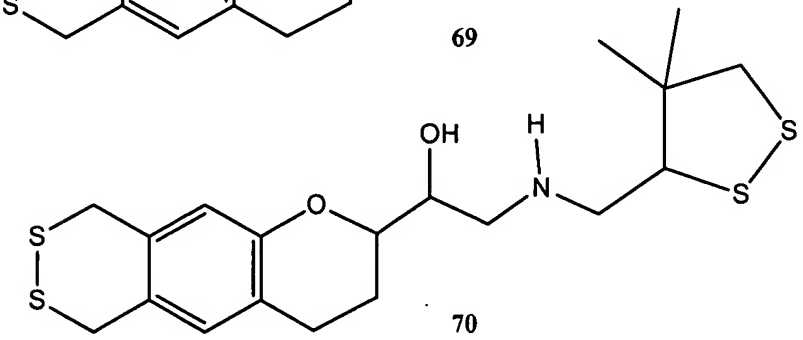

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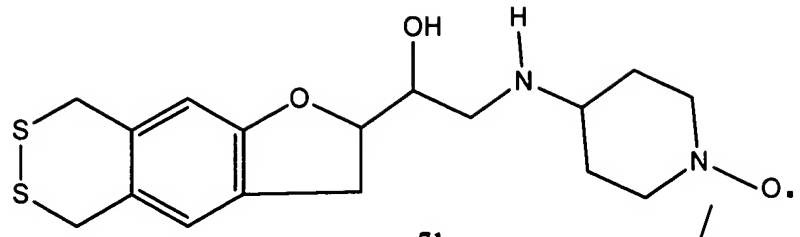

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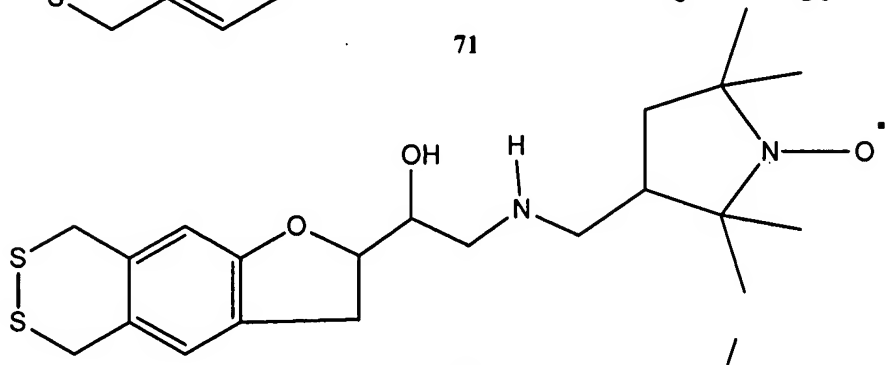

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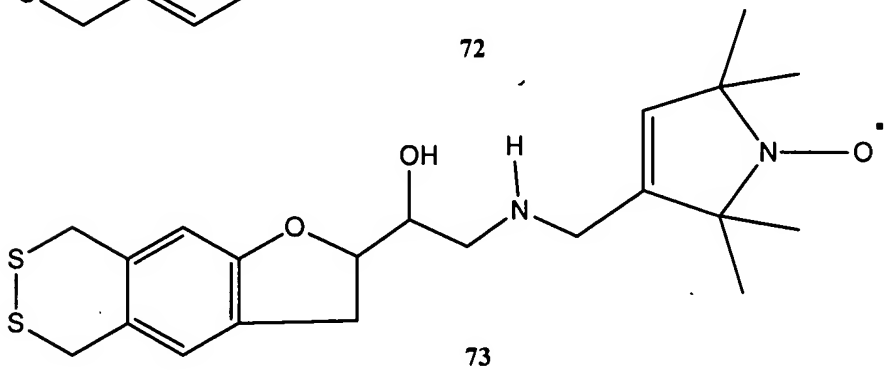

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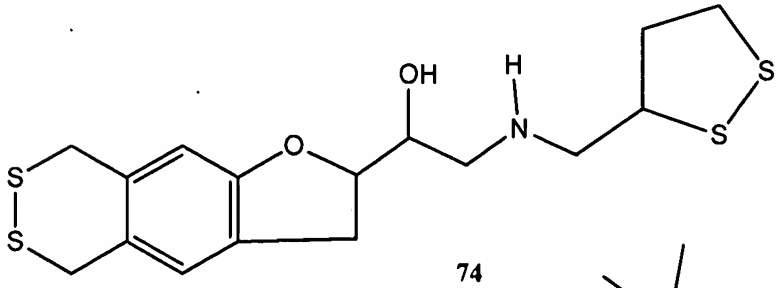

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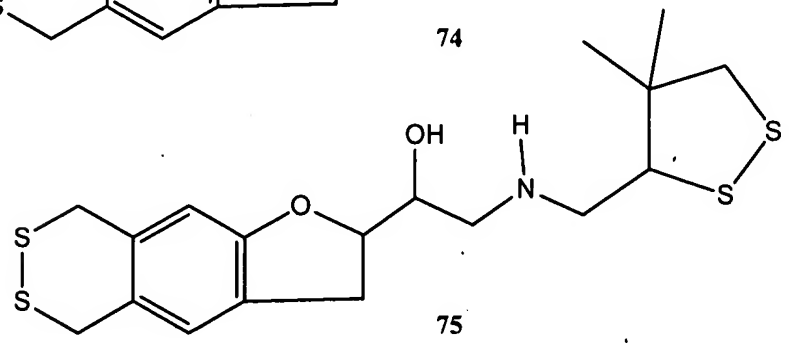

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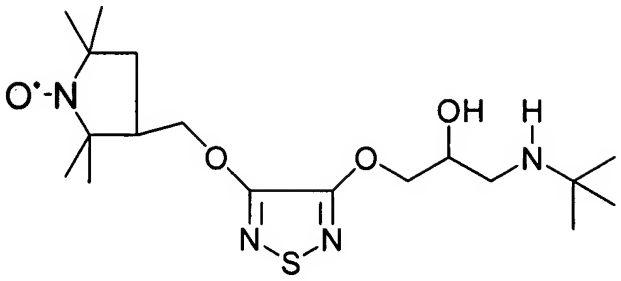

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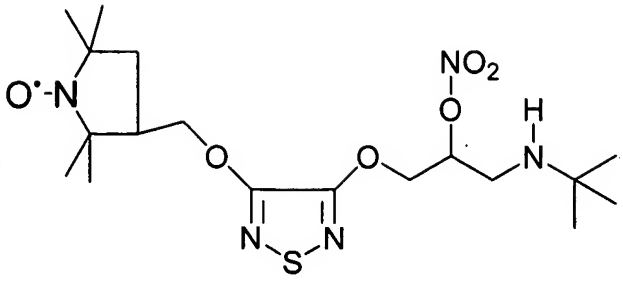

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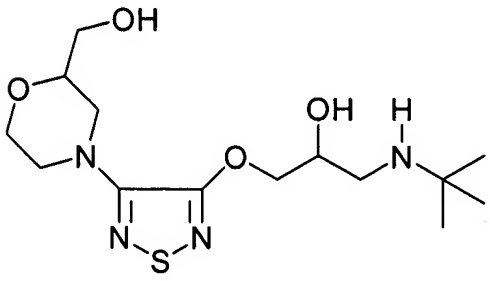

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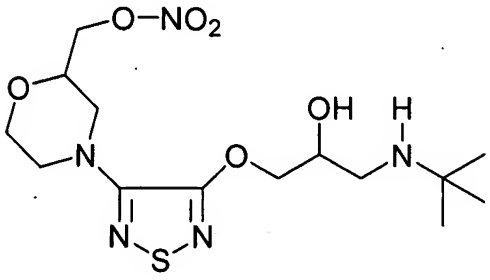

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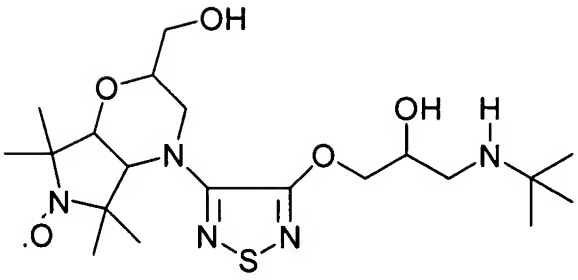

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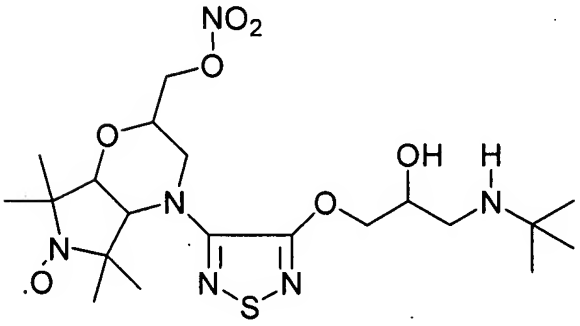

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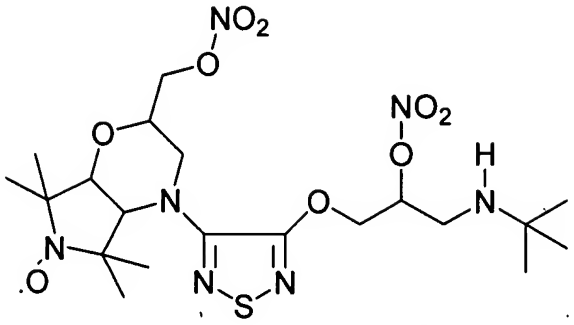

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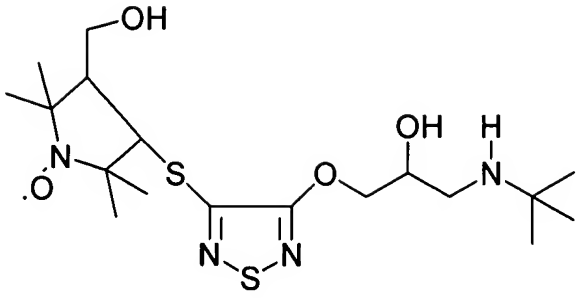

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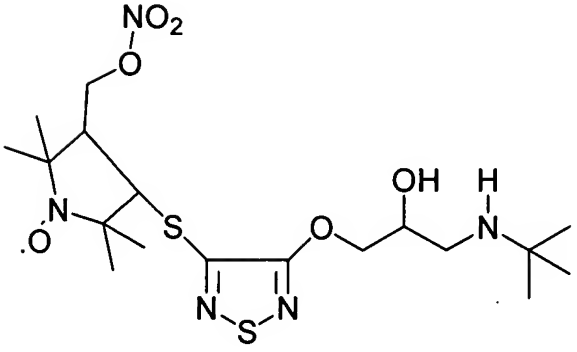

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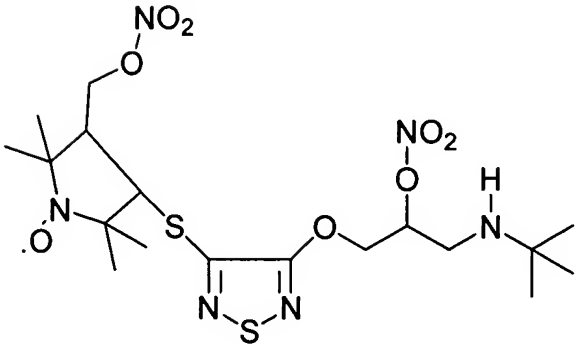

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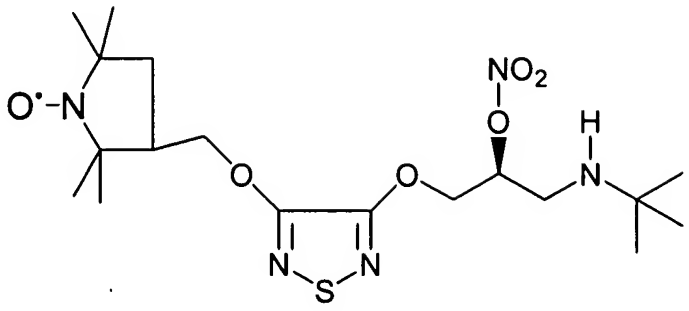

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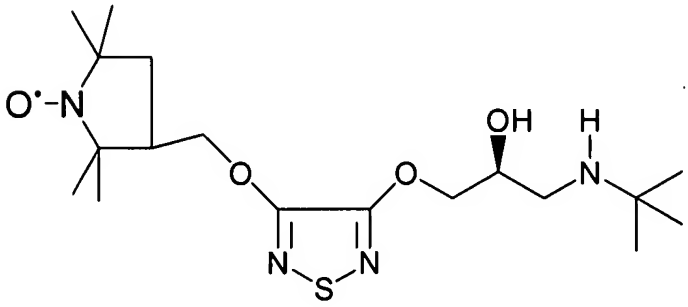

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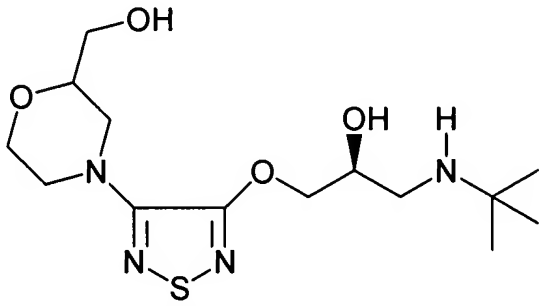

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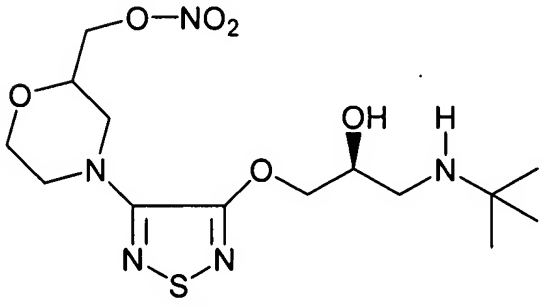

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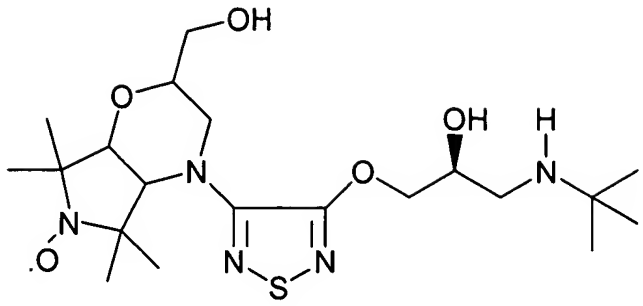

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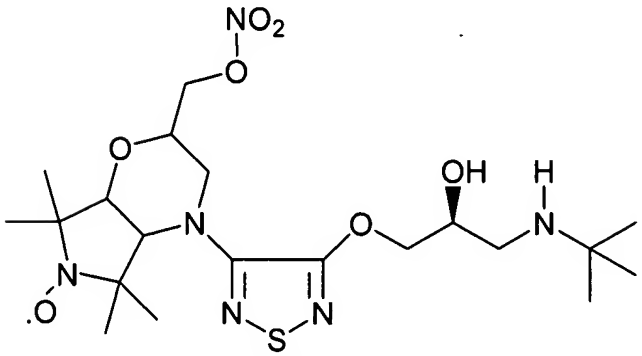

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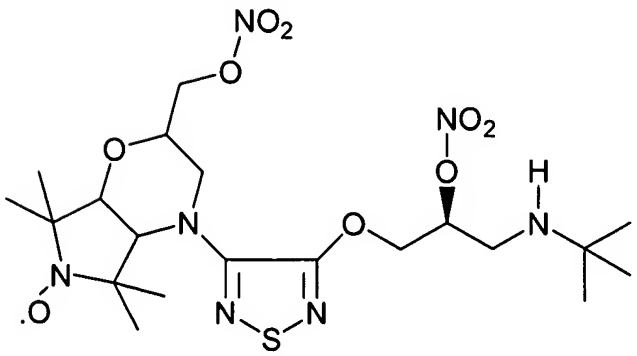

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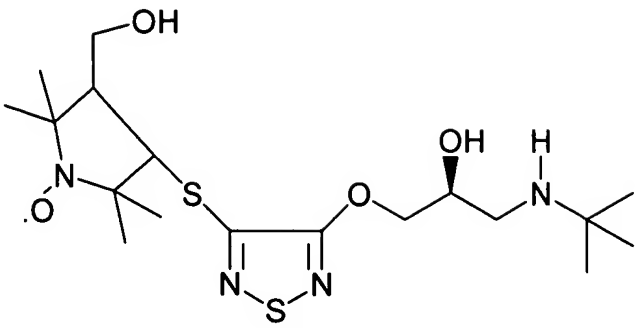

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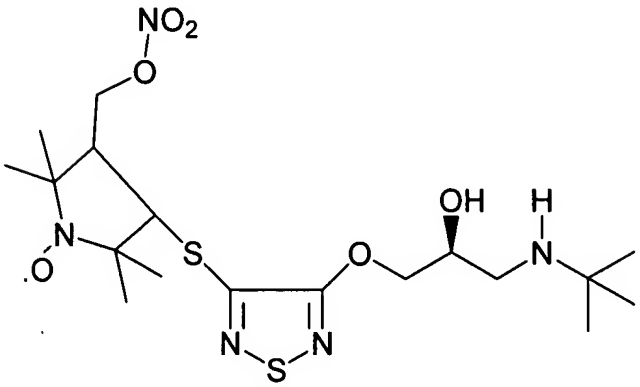

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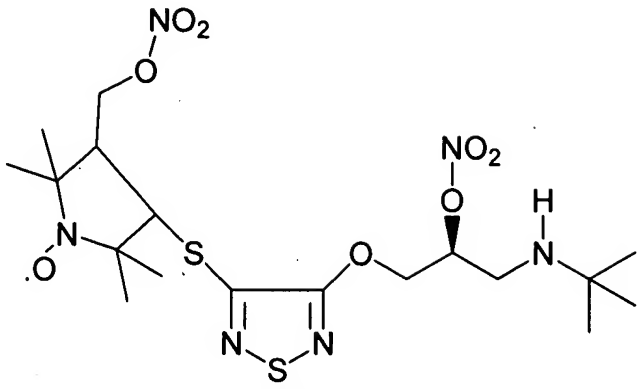

16'

Claim 84 (new): A pharmaceutical composition comprising a compound according to claim 78, or a solvate, optical isomer, or salt thereof.

Claim 85 (new): A pharmaceutical composition according to claim 84, further comprising a component selected from a carrier, binding agent, stabilizer, adjuvant, diluent, excipient, surfactant, odorant, and a second pharmaceutically active agent.

Claim 86 (new): A kit for administering a multifunctional β-adrenergic receptor antagonist compound comprising

i) a dosage amount of at least one compound having β-blocker activity and ROS-scavenging activity,

ii) instructions for use; and

iii) optionally, means for the delivery of said compound.